U.S. Department of
Transportation

1982 World's Fair Transportation System Evaluation

Phase 1 Report

December 1982

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Prepared by
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- Barton-Aschman Associates, Inc.
- Knoxville International Energy Exposition, Inc.
- K-Trans

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THE 1982 WORLD'S FAIR TRANSPORTATION SYSTEM EVALUATION

Prepared for the
Urban Mass Transportation Administration

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EXECUTIVE SUMMARY

Each World's Fair is a unique event. Many of the lessons learned in transportation planning are, however, transferable to other special events. The Urban Mass Transportation Administration (UMTA) sponsored this study to identify and evaluate the experiences of the 1982 World's Fair in Knoxville.

This Phase I report has been developed by synthesis of the insights and conclusions of the most critical participants in the development of the transportation system for the Fair in Knoxville. These include local government operating department heads, local business people, and representatives from the Knoxville International Energy Exposition, Inc., the Fair's promoter.

Topics covered in this report include: background to the study; functional components of the transportation system such as parking, roadway improvements, transit, emergency vehicles, etc.; and the important issues related to planning and inter-organizational cooperation. For each topic, information and analysis are provided and conclusions drawn.

In addition, Chapter 2 provides a summary of the overall lesson-learned in transportation planning for the 1982 World's Fair. These cover: permit applications, provision of parking, marketing to tours, transportation plan implementation, determination of promoter's role, coordination between promoter and transit company, overall cooperative atmosphere, roadway improvements, and pedestrians.

The Phase II report of the study will take a more quantitative look at several of these topics based on analysis of actual data from the Fair. That report will be completed by September 1983.

CHAPTER 1

INTRODUCTION

World's Fairs don't just happen. The major actions and events of the Fair which filled newspaper headlines were supported and founded on a myriad of decisions, efforts, hunches, or inaction by many individuals. These essential details were often little known or understood by the public. Knoxville's 1982 World's Fair was transformed from dream to reality through years of careful planning, hard work, and a widespread spirit of cooperation in achieving a common goal.

PURPOSE OF THIS EVALUATION

This "lessons-learned" evaluation was commissioned to more fully understand and benefit from the experiences which built the 1982 World's Fair. It is hoped that review of the decision-making process, actions, and consequences experienced in Knoxville will be valuable to others involved in high density special events transportation planning and management. The study is supported by the Urban Mass Transportation Administration (UMTA) under Section 8, Planning funds, and is intended for the use of all interested public and private entities.

DESCRIPTION OF THIS REPORT

Findings in this report are based heavily on interviews and meetings with key individuals involved with the Fair. In addition World's Fair planners, implementors and operators were called upon to share their perceptions and review the findings. As a supplement to these human resources limited data from a portion of the Fair's 184 day run were incorporated in this Phase I report. Readers should be aware that some of the conclusions may change as a result of the Phase II analysis. This report should be considered preliminary, and subject to modification based on further analysis of data for the full run of the Fair. The overall evaluation has been divided into two phases, serving slightly different purposes.

Phase I

The first phase was designed to provide a fairly immediate recap of the Fair's experience based predominantly on the recollections of those involved. As noted previously some quantification has been included but typically covers only a portion of the full 184 days. The reasoning behind this approach is two-fold. First, early attention to the evaluation helped insure that perishable data, such as that from files which might be discarded and people who might leave town, would be preserved. Secondly, the conclusions drawn in this Phase I report can be used immediately by those responsible for transportation at upcoming special events (e.g. 1984 New Orleans World's Fair, 1984 Los Angeles Olympics).

Specifically, the Phase I report documents the following issues related to the 1982 World's Fair transportation planning, implementation, and operation:

- who did what
- what was planned, and why
- what was implemented, and how
- why some aspects of implementation departed from the plan
- the time frame for transportation and related events, and the significance of the schedules
- what worked, and why
- what did not work, and why
- what could be improved
- what is transferable to future special events.

These issues are discussed with varying degrees of detail as they relate to a wide range of transportation subjects in this report. See the table of contents for a complete overview of what has been considered.

Phase II

The second, more in-depth, phase of the evaluation is intended to document and verify or refute the findings of Phase I based on analysis of more and more complete data. The Phase I evaluation takes a comprehensive approach in terms of the topics covered. The analysis of each is often fairly general, however. The Phase II evaluation will limit the range of topics to those considered most significant, but carry the analysis to a much greater depth. Although minor modifications may be made as Phase II evolves the topics to be covered are expected to include:

- an analysis of the organizational structure and interactions
- parking analysis
- shuttle bus service
- charter/tour bus service
- K-TRANS (local bus) service
- street circulation patterns, traffic engineering practices and roadway improvements
- access to the Fair
- regulatory agreements
- unsuccessful enterprises
- pricing of transportation services.

The Phase II report will be completed no later than September of 1983.

PARTICIPANTS

The evaluation represents a cooperative effort by many groups and individuals who were critical to the development of the Fair-related transportation system. The Knoxville-Knox County Metropolitan Planning Commission is responsible for overall coordination, project management and report development. Many critically important participants are contributing to the overall effort individually and as members of a project advisory committee. Participants include:

Barton-Aschman Associates, Inc. - The key role played by Barton-Aschman as the Fair's transportation planning consultant made their participation essential to the evaluation study. As the major subcontractor Barton-Aschman is responsible for much of the analysis and text development, and in an advisory capacity for overall project direction. Brian Bochner and Dave Miller are Barton-Aschman's representatives for the project.

Knoxville International Energy Exposition, Inc. (KIEE) - The involvement of KIEE, the 1982 World's Fair promoters, has been a crucial input to this evaluation. As a subcontractor for data provision and advise, KIEE has contributed insight of the "Big Picture" to the evaluation. Ed Keen has represented KIEE on the advisory committee.

K-TRANS - The city transit company has helped through provision of data and advise on transit related issues. K-TRANS is also subcontracted for these services. Jeff Gubitz, General Manager of K-TRANS, serves on the advisory committee.

Additional data, advice, draft review and meeting attendance has been provide by several local and state officials, greatly enhancing the depth and accuracy of the evaluation. Included are: Bob Bowers, Director, Knoxville Department of Engineering; Sam Parnell, Knoxville Department of Engineering; Terry Grubb, Regional Traffic Engineer, Tennessee Department of Transportation; Keith Thelen, former Transportation Planning Coordinator at MPC; and Les Smalley, Director, Knoxville Public Transportation Services. Tony Dittmierer of UMTA's Region IV office has also attended meetings of the project advisory committee to help answer any questions which arose concerning UMTA's expectations for the report.

WORLD'S FAIR REGIONAL SETTING AND GENERAL DESCRIPTION

The early press coverage on the 1982 World's Fair suggested that Knoxville had undertaken a project much too large to accomplish. In view of the city's size, its inexperience with tourists and its divisiveness there was some pessimism even among the Fair's supporters. But there was a hopeful, even optimistic attitude among many others. The local government, the informal power structure, and the majority of Knoxvillians seemed anxious for the Fair to be successful, not only, or even mainly, for the monetary gain but as a matter of civic pride.

Prior to 1974, the Knoxville Center City Task Force targeted the Lower Second Creek Valley as a "key redevelopment area." In September of 1974 Knoxvillian Stewart Evans heard King Cole speak about the success of the 1974 World's Fair in Spokane, Washington at the annual meeting of the International Downtown Executives Association. Mr. Evans, Chairman of the Downtown Knoxville Association approached the group with the idea of a World's Fair in Knoxville. In August of 1975 Mayor Testerman appointed a World's Fair Advisory Committee consisting of many area business leaders. It was not until February of 1976 that the 73.4 acres in the Lower Second Creek Valley was selected as the site. Later that year, the U. S. Department of Commerce endorsed an Energy Exposition in 1982 for Knoxville and the Bureau of International Expositions approved the 1982 World's Fair. The Knoxville City Council approved issuance of 11.6 million dollars in bonds to support the site acquisition in October of 1978.

The City and Region

Knoxville has a mayor-council form of government which was strongly supportive of the World's Fair by spring of 1979. The City Council had initially been divided in its support but eventually rallied behind the City's wholehearted involvement in infrastructure and service improvements needed for the Fair.

With a Governor from the Knoxville area elected to office in November 1979, the Fair had assurance of continued strong support at the state level. The Departments' of Tourism and Economic Development and Transportation dedicated effort to speed up the needed highway improvements was probably most crucial. The World's Fair was treated as a high priority economic development project. In addition to the obvious effect on the tourism industry, an important one in Tennessee, the Fair's energy theme was seen as beneficial to furthering the development of existing energy industries and to attracting new firms.

Of course, the support of local government would not have been sustained had the people of Knoxville not favored the Fair. Knoxville's two largest employers are the University of Tennessee and the Tennessee Valley Authority. These two institutions have loomed large in Knoxville for generations. One or both of them affect the majority of families in many ways. Between them, they shape the cultural, economic and recreational qualities of most Knoxvillian's lives. Both have the majority of their employees located in immediate proximity to the World's Fair site. Both institutions were supportive of the Fair as an economic development activity for the region, a physical redevelopment activity for their home city, and a showcase for the energy activities of their institutions.

The breadth of support for the World's Fair by the power structure in Knoxville was evidenced by the fact that most of the city's banks joined together with regional and national banks to provide $30,000,000 in unsecured loans to finance the Fair.

Knoxville had a very heavy investment of its pride and its money in the World's Fair. As the months rolled by toward opening day the commitment to do all that was needed for the Fair's success grew stronger. This attitude, though intangible, surely must be counted among the reasons for the Fair's success. The cooperation that made a smoothly functioning transportation system possible was an outgrowth of the broadly based citizen support for the Fair.

Knoxville's Physical Character

Knoxville is located in the geographic "heart" of the Eastern United States in a broad valley between the Cumberland Mountains to the northwest and the Great Smoky Mountains to the southeast. It is located at one of the interstate system's busiest intersections, I-40 and I-75, served by an inland waterway, and surrounded by five of the TVA Lakes of the South. Nearby institutional energy resources including the Tennessee Valley Authority (TVA), the University of Tennessee, and Oak Ridge National Laboratory, helped precipitate selection of the Fair's energy theme.

The 1980 Census showed that the Knoxville area is experiencing steady growth. Population for the SMSA grew 16.4% during the 1970's. Demographic and employment data are summarized as follows to help illustrate the socio-economic character of the area.

Table 1-1: Demographics of the Knoxville Area (1980*)

Population

Knoxville - 175,045
Knox County (includes city) - 319,694
Knoxville SMSA - 476,517
Center City - 728[1]
Knox County Per Capita Income - $7,787[2]
Median Household Income - $14,789

Employment

Knox County - 141,640
Knoxville SMSA - 211,120
Central Business District - 16,508[3]

Knox County Employment by Sector

Trade - 25.1%
Government - 22.8%
Manufacturing - 19.5%
Service - 17.5%
Agriculture - .1%

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*1980 U.S. Census

[1]Census Tract 1.

[2]Bureau of Economic Analysis.

[3]MPC Estimate.

The Fair Site

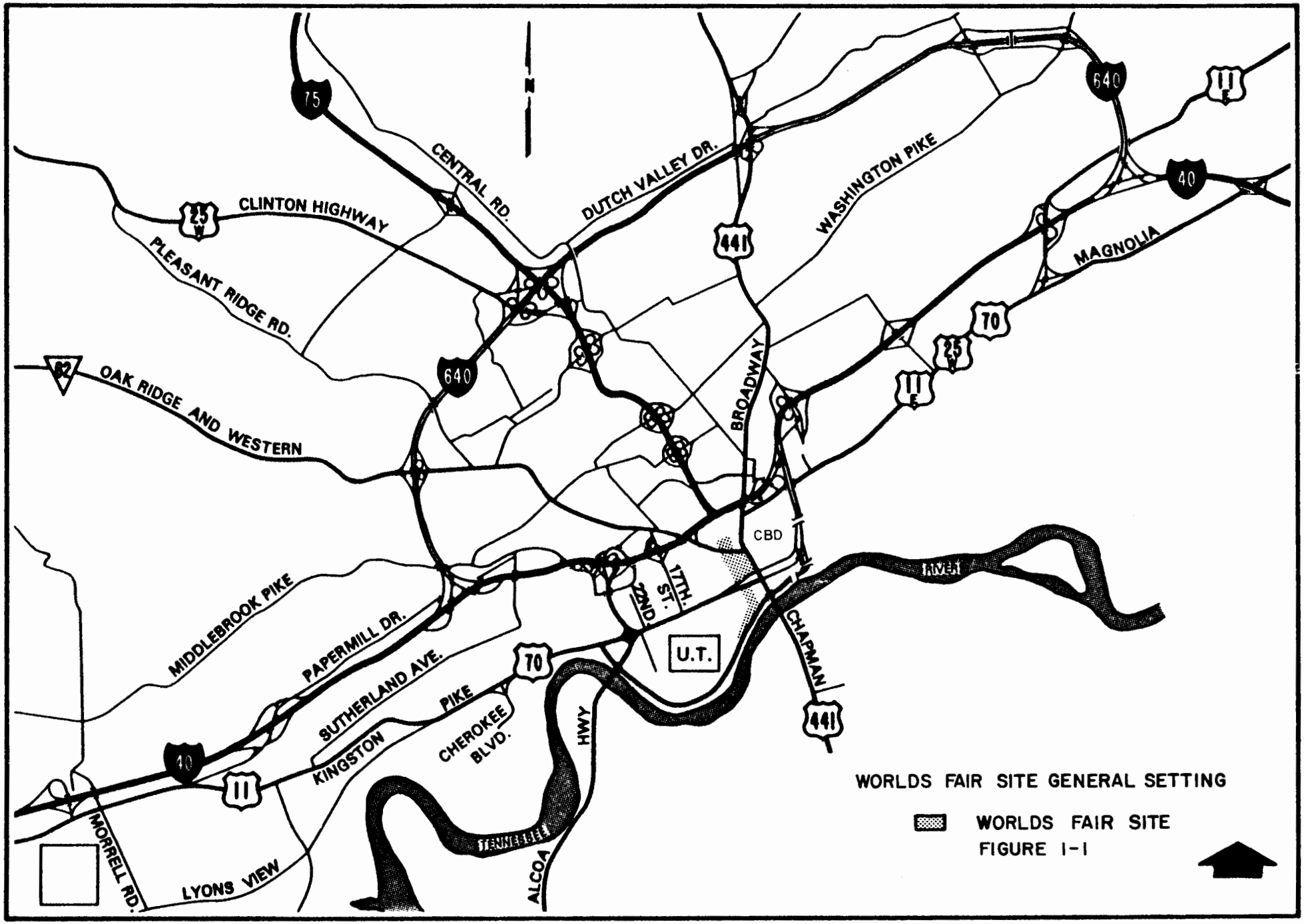
The Fair site is in an area of great congestion. The Central Business District to the east is the area's employment center. On the west lies the University of Tennessee with 25,000 students and 8,000 faculty and staff. Of these thousands who travel to the vicinity of the Fair every day because of school or employment very few use public transportation. Even though TVA has an exemplary employee van pool program, the vast majority of commuter trips to downtown Knoxville and the U.T. campus are made by autos with lone drivers.

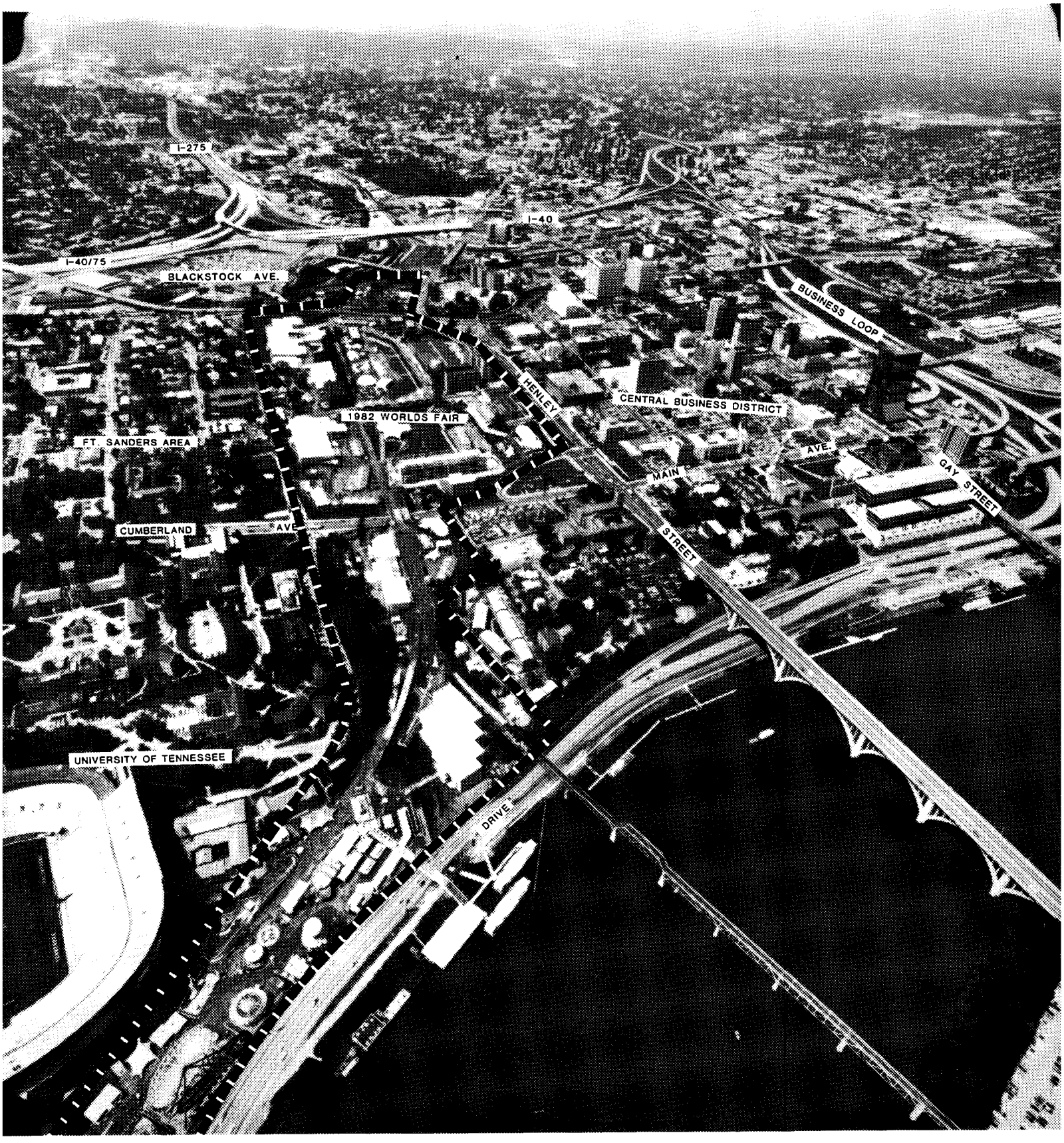
THE EVENT

The 1982 World's Fair in Knoxville was sanctioned by the Bureau of International Expositions as a Category II or Special Category Event. Five basic functions account for attendance at such events:

1. Technology and Industry exhibits
2. Cultural exchange
3. Shows and spectacles
4. Rides and amusement
5. Merchandise, food and beverage service

The most visited park in the national park system, Great Smoky Mountains National Park, draws an average of 8 million visitors every year to East Tennessee. Its proximity to major population centers and this existing visitor supply led to the projection of 11 million visitors to the World's Fair, which in fact was very close to the recorded attendance. Attendance varied considerably during the Fair ranging from around 30,000 for the lowest days to just over 100,000 for the highest days with an average close to the projected 60,000. The biggest surprise of the six month event, relative to attendance, was the pattern rather than the totals. Peak attendance days were generally in the early and late weeks of the Fair. This, coupled with low mid-summer figures, was the exact reverse of the anticipated pattern. Day-of-week patterns were basically as expected, with weekends representing the biggest crowds.


N
75
CENTRAL RD.
DUTCH VALLEY DR.
640
11E
WASHINGTON PIKE
40
CLINTON HIGHWAY
25W
441
MAGNOLIA
PLEASANT RIDGE RD.
70
25W
11E
62
OAK RIDGE AND WESTERN
640
BROADWAY
CBD
17TH. ST.
22ND
MIDDLEBROOK PIKE
PAPERMILL DR.
SUTHERLAND AVE.
U.T.
CHAPMAN
441
70
PIKE
CHEROKEE BLVD.
KINGSTON
40
11
HWY
ALCOA
TENNESSEE
MORRELL RD.
LYONS VIEW
WORLDS FAIR SITE GENERAL SETTING
WORLDS FAIR SITE
FIGURE I-1



FAIR SITE AND ENVIRONS

FIGURE 1-2

FAIR SITE AND ENVIRONS
FIGURE 1-3

TRANSPORTATION SYSTEM DEVELOPMENT

A description of the components and participants in the transportation system development is provided here to help in the understanding of lessons-learned for the 1982 World's Fair. Chapter 3 - The Transportation Plan, gives more detailed information on the actual Plan development and contents. This section is intended to give the reader an overview of the responsible parties and the events leading to implementation of the transportation system.

Cooperation by Transportation Organizations

The agencies primarily responsible for assembling a transportation system for the Fair were KIEE, the City of Knoxville, and Tennessee Department of Transportation (TDOT). However, as shown in Table 1-2, many additional agencies and organizations contributed to the development of transportation facilities and services.

In the early stages of planning, KIEE took the lead role with the assistance of the City of Knoxville. TDOT became involved through the Interstate Highway reconstruction and other roadway improvements involving state funds. The Federal Highway Administration became involved primarily through its participation in funding.

During the last year prior to opening, TDOT played a more active role, working closely with KIEE and the City to make final preparations. UMTA also became involved through the funding process as it supported advanced acquisition of new buses and a grant for support facilities and equipment.

It is important to note the roles played by UMTA and FHWA. Normally these two agencies are involved in disbursing Federal funds, planning guidelines, and operational policies. A major part of their involvement is, typically, to insure compliance with Federal guidelines.

Their participation in the 1982 World's Fair placed less emphasis on compliance with regulations (although compliance with these guidelines was still necessary). The major emphasis here, was on playing a cooperative and supportive role in assisting Fair organizers, the City, and the State in keeping preparations for the Fair on schedule. The most important changes in the Federal approach were adoption of this "assistance role" and reducing review and decision periods.

TABLE 1-2

ORGANIZATIONS INVOLVED IN 1982 WORLD'S FAIR TRANSPORTATION SYSTEM IMPLEMENTATION AND THEIR ROLES[1]

ORGANIZATION	OVERALL ROLE RELATIVE TO FAIR	TRANSPORTATION ROLE
Knoxville International Energy Exposition, Inc. (KIEE)[2]	- Plan, acquire approvals, acquire funds and stage World's Fair.	- Provide, coordinate, or encourage transportation to Fair, including parking; work with and support other implementing organizations to achieve desired transportation system.
City of Knoxville	- Facilitate Fair implementation by providing supportive public policies, facilities, and services.	- See below.
Department of Engineering (incl. Traffic Engineering)[2]		- Improve streets; institute parking policies; improve signing and striping; improve traffic signal operation; issue temporary parking lot permits.
Department of Community Development		- Through Public Transportation Services Division, regulate taxis, limousines, local shuttle buses, and special modes; enforce regulations.
Police Department		- Expedite traffic flow and enhance safety through enforcement and direction of traffic; enforce parking regulations; provide security as requested in support of KIEE's own force.
Knoxville's Community Development Corporation	- Acquire land for redevelopment of Fair site and supporting infrastructure.	- Acquire land for site and expanded Henley Street right-of-way.
Knoxville Transit Authority (incl. K-TRANS)[2]	- Provide public transportation service within service area.	- Provide scheduled bus service; provide special shuttle service under contract to others.
State of Tennessee	- Enhance benefits of Fair to State through policy, financial, and publicity support.	- See below.
Department of Transportation[2]		- Plan, design and construct Interstate Highway improvements; construct Henley Street and other State route surface street improvements; install trailblazer and other highway signing; lease surplus right-of-way for parking lots.

TABLE 1-2 (Cont.)

ORGANIZATIONS INVOLVED IN 1982 WORLD'S FAIR TRANSPORTATION SYSTEM IMPLEMENTATION AND THEIR ROLES[1]

ORGANIZATION	OVERALL ROLE RELATIVE TO FAIR	TRANSPORTATION ROLE
State of Tennessee (Cont.)		
Department of Tourism		- Publicize World's Fair; work with tour operators to enhance Fair-oriented tours; encourage other state agencies to support Fair.
Department of Finance		- Identify means and sources for reprioritizing funding for Knoxville area projects supportive of Fair.
Public Service Commission		- Regulate and issue operating authority for shuttle service from outside K-TRANS and City areas of jurisdiction; inspect vehicles of public conveyance for safety and licensing compliance.
State Police		- Expedite traffic flow on State highways.
Federal Government	- Support Fair financially and politically to international organizations.	- See below.
Department of Transportation (UMTA, FHWA, FAA)		- Support state and local transportation projects financially; facilitate transportation support of Fair through policy positions; permit temporary ramps on Federal Aid freeways to enhance access to Fair; support effective provision of public transportation through special funding; regulate air service to enhance safety in vicinity of Fair.
Department of Commerce		- Handle federal sanctioning of Fair; provide official liaison between KIEE and foreign governments; work with KIEE to meet foreign exhibitors' transportation needs.
Department of Housing and Urban Development		- Provide federal funding to support site and street right-of-way acquisition and installation of selected infrastructure.

TABLE 1-2 (Cont.)

ORGANIZATIONS INVOLVED IN 1982 WORLD'S FAIR TRANSPORTATION SYSTEM IMPLEMENTATION AND THEIR ROLES[1]

ORGANIZATION	OVERALL ROLE RELATIVE TO FAIR	TRANSPORTATION ROLE
Federal Government (Cont.)		
Department of Defense (Army Corps of Engineers)		- Regulate transportation on Fort Loudoun Lake (Tennessee River); install pedestrian bridge (Baily type loaned by army) across Neyland Drive.
KIEE Consultants	- Provide necessary technical expertise to KIEE for planning, implementing, operating Fair.	- See below.
Economic Feasibility (EDCON, Economic Research Associates)		- Prepare economic feasibility studies for Fair, including estimates of attendance, visitor characteristics, length of stay and origin, and requirements for successful Fair.
Architectural (McCarty, Bullock, Holsaple)		- Lead master planning team; prepare initial and update plans; prepare or oversee site design and common area architecture including gate areas; work with KIEE to secure political and funding approvals.
Engineering (Barge, Waggoner, Sumner, Cannon)		- Assist Master architect in leading design efforts; prepare engineering plans for site and adjacent roadway improvements; assist in securing federal funding; work with KIEE to secure political and funding commitments.
Transportation (Barton-Aschman Associates, Inc.)[2]		- Prepare transportation element of initial and updated master plans; create and supervise Transportation Service Division for KIEE; direct implementation and operation of transportation system; negotiate KIEE transportation contracts; assist KIEE in securing transportation related funding assistance.
Ticketing and Gate Operations (Management Resources, Inc.)		- Prepare gate operation and ticketing plans; work with transportation consultant on transportation ticketing; operate Fair admission effort.

TABLE 1-2 (Cont.)

ORGANIZATIONS INVOLVED IN 1982 WORLD'S FAIR TRANSPORTATION SYSTEM IMPLEMENTATION AND THEIR ROLES[1]

ORGANIZATION	OVERALL ROLE RELATIVE TO FAIR	TRANSPORTATION ROLE
Private Sector Transportation Operators and Interests	- Operate transportation to Fair and/or support transportation operators' interests.	- See below.
National Tour Broker's Association		- Coordinate and represent tour operators' Fair related interests and needs, including satisfactory tour bus accommodations; provide publicity to tour operators regarding Fair.
American Bus Association		- Represent bus and tour operators' interests; provide information about Fair arrangements, including bus terminals and parking.
Greyhound (official motorcoach carrier of Fair)		- Provide assistance to KIEE regarding tour bus operations and needs; provide tour and scheduled bus service to Fair.
Other intercity bus companies		- Provide bus service (tour, some shuttle and some scheduled service) to Fair; provide advice to KIEE on request.
Shuttle bus companies		- Provide shuttle bus service to Fair from remote parking lots, hotels, motels, campgrounds, and nearby cities.
Parking lot operators		- Operate "official" Fair parking lots under contract with KIEE standards; operate "unofficial" parking lots supporting Fair under contract with others.
Parking lot owners and lessors		- Provide or operate lots on own or leased land, either "official" meeting KIEE standards or "unofficial".
Taxi and limousine operators		- Operate taxi and limousine service to and from Fair, either under temporary (6 months) or permanent operating authority/licensing.

TABLE 1-2 (Cont.)

ORGANIZATIONS INVOLVED IN 1982 WORLD'S FAIR TRANSPORTATION SYSTEM IMPLEMENTATION AND THEIR ROLES[1]

ORGANIZATION	OVERALL ROLE RELATIVE TO FAIR	TRANSPORTATION ROLE
Private Sector Transportation Operators and Interests (Cont.)		
Special mode operators		- Provide tri-shaw, helicopter, ferry, or other transportation service to Fair.
Towing contractors		- Assist KIEE in clearing illegally or improperly parked vehicles from Fair site, parking lots, bus terminals, or streets.
Trucking companies		- Move goods to Fair; remove waste materials.

[1]Includes only those organizations involved in transporting patrons, employees, or goods to World's Fair site.

[2]Organizations with primary responsibility for transportation planning, organization, and implementation. Other organizations primarily involved in policy, funding, or operation.

Decision Process

Perhaps the most important action to facilitate the interagency cooperation was the handling of decisions by each organization. Major commitments and overall budget approvals were made at the policy level. However, small to moderate budget decisions and decisions affecting operations and physical improvements were delegated to or assumed by implementation level staff. This enabled the staffs of all cooperating organizations to reach conclusions and decisions much more quickly and avoid political compromises often inherent in detailed project review by policy bodies.

It is unlikely that the transportation system would have achieved its final form or operated as efficiently, if actions had been carried through traditional decision-making processes.

Working Relationships

Inter-organizational working relationships were primarily at the staff level. However, cooperative relationships were also present at the policy/political level, primarily due to the realization of all parties involved that they were working for the betterment of the Fair, the City, and the State.

Power Structure. As mentioned previously, the earliest efforts to stage a World's Fair in Knoxville involved community and political leaders (mayor plus business and civic leaders). This continued throughout the Fair's preparatory stages. The Fair's leadership represented a fairly broadbased cross-section of the community's leadership. More importantly, this leadership had solid ties to the business, civic, and political leadership of local, state, and federal levels, among both Democrats and Republicans. These ties evolved at all levels between 1975 and 1982. This facilitated cooperation among various entities involved in staging or supporting the Fair. This common bond permeated to the staff level where a high degree of cooperation was usually present.

The political leadership at the local level was somewhat fragmented due to the diverse positions represented by elected officials. The Fair's leadership was able to effectively bridge the varying interests and jurisdictions by the very nature of its broad base--organized to draw on support from all factions of the community.

Staff Level. The staff level working relationship was enhanced by prior cooperative efforts. Representatives of the KIEE Transportation Services Division, the City of Knoxville, and the Tennessee DOT had all worked together for several years on a number of projects. In addition, nearly all had been involved from the initial stages of World's Fair planning. This prior experience, the knowledge of the City and Fair project, and mutual respect among the individuals, all created a sense of harmony. A substantial effort would have been required to create such a spirit of cooperation, had these conditions not been in place.

Early Roles

During the initial planning stages, KIEE and its consultants generated a transportation plan and a set of needs. These were reviewed with the City staff to achieve general concurrence.

Cooperation among KIEE, the City, and TDOT was achieved in pursuing improvements requiring joint participation. The most important of these efforts was the advancement of the Interstate Highway improvement program by about ten years. This was spearheaded by the World's Fair organizing committee and Chamber of Commerce with the strong support of the City. A bi-partisan political approach and extensive cooperation between private and public sector interests was key to the success of this effort.

The City and TDOT also worked closely to achieve the Henley Street widening, which had been all but indefinitely deferred due to the difficulty that TDOT would have faced in assembling right-of-way (see Chapter 4 for details).

Roles During Implementation Phase

During the last year prior to opening of the Fair, additional transportation operating entities became involved. Communication and coordination were greatly enhanced by establishment of the Traffic Committee about 14 months prior to opening of the Fair. This was an outgrowth of a related effort involving the Police Department. The Knoxville Police Department took the lead in organizing the committee, recognizing its future responsibility for traffic control. Its members included the Transportation Services Division of KIEE; the City Engineering, Traffic Engineering and Police Departments; K-TRANS; and the Tennessee DOT Design Traffic Engineering Department. The committee initially met once a month, but later met as often as once each week to discuss transportation planning and implementation progress and issues. Despite

periods when no meaningful progress could be identified, this committee facilitated reviews and opened lines of communication which had not previously existed.

In addition, weekly breakfast meetings were held during the last eight months preceeding opening day for representatives of several KIEE departments, the City Engineer, KIEE's consulting site engineer, a representative of the Mayor's office, and a member of the KIEE management committee. The group met to achieve a different level of coordination. Policy and staff level persons discussed issues and priorities needing attention at the policy as well as the operations level. These meetings proved useful in assuring steady progress was being made. It was also a forum for establishing strategies for implementation or problem solving. These meetings continued until about two months before opening the Fair when other demands necessitated that they be abandoned except for special occasions.

Key Persons. Four key persons guided the implementation phase of the World's Fair transportation system. These were the Director of the KIEE Transportation Services Division, the City Engineer, the City Traffic Engineer, and the TDOT Regional Traffic Engineer. Particularly during the last three to four months, these individuals were in almost constant contact, coordinating and making decisions on what was to be done. All four had management/policy approval to make commitments on behalf of their organizations. This enabled many of the less visible details, such as signing, one-way street changes, minor traffic improvements, parking restrictions, etc., to be made quickly and with little difficulty.

During the operational phase, the City's designated police lieutenant for traffic control was instrumental in helping to solve start-up challenges and problems. He, the City Traffic Engineer, and the KIEE Transportation Services Division were in daily contact. Because of their prior work together, all key persons were able to cooperate with no problems caused by allegiance to different agencies.

One area which was less successful than others was the development of cooperative arrangements with the University of Tennessee. With their first responsibility being to the students and staff, and facing significant pressure from those groups, the University was not able to reconcile its parking needs with those of the Fair.

Conclusions

The operational success of the World's Fair transportation system was largely due to the high level of cooperation between all entities involved. All parties identified this as the key to success. This experience was considered to be a positive one by all, and an excellent example of what could be achieved when all interests combined their forces. All parties involved agreed that the short-term and long-term benefits of the transportation system would not have been achieved without unified cooperation.

KIEE leadership was able to achieve cooperation at all civic, business, and political levels, in a community with very fragmented and diverse attitudes, and so was able to bring about a successful Fair in a small city with resources more limited than might otherwise be thought necessary.

DECISIONMAKING BY KIEE

While many organizations contributed greatly to development of the Fair related transportation system, the catalyst for these efforts was KIEE. Unlike the public sector entities involved, KIEE's primarily objective was the provision of needed transportation facilities and services for a limited duration event. The individuals who made up KIEE management were local business and community leaders who clearly had a long-term incentive for community betterment. Their specific responsibility and authority, however, was to the Fair.

KIEE Basis for Transportation Decisions

KIEE was formed as a non-profit corporation to organize, plan, implement and operate the World's Fair in Knoxville. From inception Fair management recognized that Fair activities could be separated into two categories; (1) activities directly connected with the Fair itself which were generally located within the Fairgrounds e.g. exhibits, physical facilities, entertainment, on-site visitor services, etc.; and (2) activities in support of the Fair which were generally located outside the Fairgrounds e.g. housing, transportation, parking, law enforcement, food services and other tourist related commercial services, etc.

The 1982 World's Fair was held in a downtown, urban area which already contained a well developed core of support services. Fair management made a basic decision to utilize this service core and encourage expansions where feasible. The Fair would only fill the voids, where private entrepreneurs fell short of satisfying needs. The result was to spread the economic benefits and risks of the Fair, enable KIEE to concentrate its resources on direct activities and not spend where other businesses could adequately expand to provide the same role.

Speculative Fever

It is important to adequately describe a phoneman, best characterized as "speculative fever", that evolves within the local business community as the event approaches. Attracting millions of visitors to a limited duration event located in an area which does not have all services fully developed to meet their temporary needs, stimulates the entrepreneural juices in the most conservative of businessmen. Therefore, it is not surprising that many ventures related to housing, food services, transportation, parking, and merchandising are conceived and planned. Some fall by the wayside before they are realized, but many are implemented. This seems to be a World's Fair tradition, experienced in New York, Seattle, San Antonio and Spokane, and repeated in Knoxville. Since each World's Fair is its own unique setting and its own time, there is little relavent experience to draw from. Normal risk/reward judgements become distorted and there is no time for prospective businessmen to develop a competitive feel for the marketplace. The event happens only once.

The three transportation elements most affected by this "speculative fever" were visitor parking lots, shuttle buses, and taxis. In all cases, many entrepreneurs rushed to fill what they felt was a local deficiency, often without looking around to see how many other similar ventures were being formed.

CHRONOLOGY OF THE TRANSPORTATION SYSTEM'S DEVELOPMENT

Literally thousands of separate events, decisions, and actions were involved in the making of the 1982 World's Fair. Knowledge of the events and especially the relative order of events is important in understanding how the Fair came about. Development of the Fair and its transportation system took place in three stages:

1. Formative Stage - included organization and formulation of a Fair concept and master plan to be used in seeking official World's Fair certification. The first phase of a transportation system was planned from August-October 1976. This first or formative stage spanned from 1975 to late 1976, overall.

2. Approvals Stage - including commitments from all organizations to be involved, Bureau of International Expositions certification, and funding approvals. Approval of major roadway improvements, not already programmed, took place from 1976-79, first in principle, then officially. The second or approval stage lasted from late 1976 to October 1979, overall.

3. Implementation Stage - including construction, securing exhibitors, preparing for operation and marketing the Fair. This final, implementation, stage began with plan refinement in late 1979 and ran until opening day on May 1, 1982. The transportation operating staff was not hired until July of 1981, however. This date could be considered the actual beginning of implementation.

Table 1-3 lists transportation related events in chronological order.

TABLE 1-3: CHRONOLOGY OF TRANSPORTATION AND RELATED EVENTS

DATE	EVENT
November 1974	Downtown Knoxville Association approves the concept of a World's Fair for Knoxville; the "quantum jump" envisioned as a catalyst to downtown redevelopment.
February 20, 1976	Lower Second Creek site is selected.
July 1976	Decision is made to install a computer supervised traffic signal system in Knoxville.
August 16, 1976	The design team signs contract for site design.
August 28, 1976	U. S. Department of Commerce endorses 1982 Energy Exposition in Knoxville.
November 8, 1976	Barton-Aschman authorized by City of Knoxville to prepare design concept for Malfunction Junction reconstruction to facilitate access to downtown and Fair site; for input to TDOT design effort.
February 2, 1977	Revised Fair site plan omits previously planned parking areas; necessitates remote parking be planned.
April 26, 1977	President Carter approves the 1982 World's Fair.

TABLE 1-3: CHRONOLOGY OF TRANSPORTATION AND RELATED EVENTS (CONT.)

DATE	EVENT
April 27, 1977	Bureau of International Expositions approves the 1982 World's Fair.
May 1977	TDOT agrees to schedule improvements which will assure interstate completion by May 1982.
1979	Decision for KIEE to depend on private sector to provide parking and shuttle service--and that transportation system must operate on a break-even basis.
October 12, 1979	30 million dollar loan package secured. Guaranteed completion of interstate improvements is a condition of the loan agreement.
January 17, 1980	UMTA grant for 11 new buses approved.
January 30, 1980	No strike agreement negotiated with Knoxville Building Trade Council, for site and road work.
May 6, 1980	UMTA grant for 29 additional new buses approved.
May 1980	Transportation Plan updated.
October 1980	Department of Engineering makes decisions on surface street impacts, lane closures and circulation changes. Love Field Monorail proposal examined and rejected.
March 25, 1981	Traffic committee established by Knoxville Police Department to improve coordination and communication on traffic issues.
June 13, 1981	City Council passes latest Taxi Cab Ordinance Revision.
July 1981	Barton-Aschman retained by KIEE to implement Transportation Plan; create and direct Transportation Services Division of KIEE.

TABLE 1-3: CHRONOLOGY OF TRANSPORTATION AND RELATED EVENTS (CONT.)

DATE	EVENT
August 1981	All agencies involved in transportation for Fair meet to consider overall status of transportation system development.
September 15, 1981	Temporary parking lot ordinance passed by City Council.
October 1981	Funding for pedestrian overpass and transit support equipment by UMTA.
December 1, 1981	American Bus Association names Fair as top North American tourism event in 1982.
December 1981	First parking lot operator lease signed with KIEE.
December 8, 1981	World's Fair/City Coordination Committee established to improve communications between Fair and City.
December 8, 1981	Temporary campground ordinance passed by City Council.
December 23, 1981	City Engineering, KIEE, TDOT agreement on signing system to direct visitors from interstate to parking lots.
December 1981	KIEE/TDOT/City agreement to design and build the "missing link" of Blackstock Avenue.
January 1982	Temporary operator provision set up for transit union.
January 1982	Tennessee Public Service Commission meeting, to consider shuttle and taxi operating permits, postponed due to ice storm; further delayed implementation.
January 1982	Lease agreement signed with TDOT for north parking lot. Agreement with TDOT for use of AM radio frequency and equipment to provide visitor transportation information.

TABLE 1-3: CHRONOLOGY OF TRANSPORTATION AND RELATED EVENTS (CONT.)

DATE	EVENT
January 1982	City Council gave City Engineering Department "go-ahead" to close Clinch Avenue from 11th Street-Henley Street.
February 16, 1982	Shuttle bus ordinance passed by City Council.
March 26-27, 1982	1000 tour bus operators attend Familiarization ("FAM") Tour provided by KIEE.
March 29, 1982	Completion (formal opening) of "malfunction junction" reconstruction (I-75/I-40 intersection).
March 1982	First unofficial parking lots appear.
April 1982	Contracts signed between KIEE and private operators for remote parking lot shuttle services.
April 1982	TDOT agreement to allow a heliport on I-40 right-of-way near Western Avenue.
April 1982	Trailblazer signs installed on Fair approach routes.
April 1982	Temporary freeway ramps to facilitate access to Fair completed.
May 1982	Computer supervised traffic control system begins operation.
May 1, 1982	Opening day of the 1982 World's Fair.
May 10, 1982	Adjustments to transportation system virtually completed; meeting opening month transportation demands.

CHAPTER 2

PHASE I - SUMMARY OF "LESSONS LEARNED"

This evaluation is intended to identify, analyze, and communicate the lessons learned through Knoxville's transportation experiences with the 1982 World's Fair. These lessons should be of help not only to others in future special events planning, but to Knoxville in assessing a variety of its own strengths and weaknesses.

The lessons identified here are relatively broad statements, underlaid by many minor conclusions found throughout the report. In each instance reference is given to the location of related sections in the text.

PERMIT APPLICATIONS

A cut-off date 90-120 days prior to opening of the Fair should have been established for parking lot, shuttle service and taxi operation permit applications. The early application date and a published listing of the number of services, parking spaces, etc., permitted, would have helped to lessen the speculative fever which rose in the final weeks before opening. No date or efforts to disclose permit information was established because of a feeling that everyone was entitled to a share of the "success" and hence, no restrictions should be imposed. Consequently, there were far too many providers, with the resulting congestion, low revenues, and the social impacts of numerous business failures. (See also: pp. 71, 77, 94, 116, 120, 151, 153.)

PROVISION OF PARKING

The private sector is typically able to provide an adequate supply of parking facilities. The early cut-off date described previously, would have helped potential providers better assess the market conditions. KIEE could have avoided getting into the parking lot business had there been documentation that adequate parking would be provided. Experiences at the Spokane and Seattle World's Fairs showed private development of adequate parking but KIEE eventually developed their own visitors lots under pressure from the media and tour operators concerned with the lack of documented parking facilities. (See also: pp. 70, 93.)

MARKETING TO TOURS

Marketing and facility provision aimed at attracting bus tour promotions had a significant impact on the Fair's attendance totals and pattern. Provision of a tour bus terminal at the north gate and early, aggressive marketing targeted at the tour industry dramatically raised the number of visitors who came via bus, skewed the attendance pattern toward spring and fall versus summer, and increased national awareness of the Fair at low cost to KIEE due to advertising sponsored by tour groups. (See also: pp. 41, 101, 107, 163.)

TRANSPORTATION PLAN IMPLEMENTATION

Implementation of the transportation plan and establishment of a transportation operating staff must be timed to balance necessary staff functions with limited resources to support personnel. Implementation began nine months prior to opening of the 1982 World's Fair. At that point the staff was forced to deal with a multitude of brush fires at the expense of some important overall planning and management activities. The large number of critical components to be staffed for a successful Fair, coupled with a limited personnel budget, dictated that all could not be developed to the ideally desired level. The transportation system functioned very well despite the late start up of implementation. (See also: pp. 22, 24, 38, 44, 75.)

DETERMINATION OF PROMOTERS ROLE

The promoter must determine as early as possible which functions are legitimately within its sphere of responsibility and capability, and which are not. The decisions to get involved in parking provision and housing reservations were difficult, and in some respects disastrous, in Knoxville. An early determination of the essential roles for the promoter, and an associated effort to delegate or avoid the inappropriate, will improve performance in the chosen roles. This also gives clearer signals to the other potential service providers in the community, regarding their roles. (See also pp. 22, 24, 38, 40, 43, 45, 59, 69, 72, 74, 92, 100, 115, 118, 140.)

COOPERATION BETWEEN PROMOTER AND TRANSIT COMPANY

Negotiations, with the local transit company (K-Trans) could have been improved two ways: (1) by an early determination by KIEE of transit services they would provide, thereby

identifying what would be left to K-Trans, and (2) earlier negotiations between K-Trans and KIEE, allowing time to reach needed compromises on service contracts. The negotiations which took place were hampered by delayed decisions on service needs and delayed agreement on contract terms. (See also: pp. 122, 130, 131, 140.)

OVERALL COOPERATIVE ATMOSPHERE

Inter and intra organization cooperation in the public and private sectors was absolutely essential to the success of the 1982 World's Fair. All participants were generally directed toward a common objective. Decision making authority was either delegated to or assumed at the staff level to insure prompt attention to actions which could not afford to be delayed by lengthy debate. Because the speed of these decisions often precluded public discussion, the system was sometimes perceived to be secretive. (See also: pp. 15, 21, 22, 53, 66, 67, 101, 140.)

ROADWAY IMPROVEMENTS

Roadway and interstate improvements must be envisioned very early in planning for a special event to allow the necessary lead time for planning, funding, design and construction. Approximately six years for interstate and four years for local road improvements is considered essential. (See also: pp. 38, 39, 57.)

PEDESTRIANS

Pedestrian movement and safety were maximized by: (1) separation of pedestrian from vehicle access points, (2) design of pedestrian access so that large crowds do not have to cross major thoroughfares, and (3) supplementing signals with police traffic control during peak periods. The segregation of pedestrian from vehicle access also improved vehicular traffic flow around the 1982 World's Fair site. (See also pp. 141, 143, 144.)

CHAPTER 3

TRANSPORTATION SYSTEM PLAN - PROCESS AND COMPONENTS

From the beginning, the organizers realized that transportation would be a major determinant in the success of the World's Fair in Knoxville. Transportation was one of the criteria used in the site selection process.

One of the motivations behind the Fair was the residual transportation improvements it would generate. Completion of I-640 and improvement of "Malfunction Junction" the congested downtown interchange of I-40 and I-75, were among the city's highest priorities. In conjunction with selection of the Lower Second Creek valley for the Fair, from among sixteen candidate sites, a commitment was made to improve access to the site, particularly via the Interstate Highway system.

PLANNING PROCESS

Initial Studies

Initial organizing efforts for the Fair got under way in earnest in 1975. By mid-1976, an economic feasibility study was in progress. This study produced key information needed to prepare a transportation plan. This information included projections of: average daily attendance, maximum on-site accumulation as a percentage of daily attendance, distribution of Fair visitors by residential location and distance from the Fair, an assessment of lodging locations, and an estimated duration of stay. The study also identified key factors necessary for the Fair to be a success.

During the summer of 1976, the organizing committee selected its Master Architect--or more accurately a team of architects, civil and transportation engineers, and theme park planners--to prepare a physical plan for the Fair. The inclusion of a transportation engineering firm on the team reflected the commitment by KIEE to provide good transportation access to the Fair. The resulting plan was to be presented and reviewed by the community, the U.S. Department of Commerce (sanctioning agency of the U.S. government), and the Bureau of International Expositions (BIE), (the international agency for certifying official World's Fairs). The transportation plan was a part of the master planning effort.

The initial transportation plan was prepared during a sixty day period in late summer 1976. Much of the ultimate plan was devised during this short period. The transportation planning process identified the major transportation issues to be resolved, necessary physical improvements, and the components of the World's Fair transportation system (see Table 3-1). This initial plan was to be refined as time went on, if the World's Fair organizers succeeded in achieving BIE certification.

During the same period, the master architect devised a site plan. One of the most important parts of the site planning process was the set of decisions relating to access to the site. Transportation system characteristics were among the determining factors in establishing the number and locations of gates.

TABLE 3-1: 1982 WORLD'S FAIR TRANSPORTATION SYSTEM COMPONENTS

COMPONENT	RESPONSIBLE ENTITY FOR OPERATION AND REGULATION
Fair access gates	KIEE
Fair patrons	
Employees	
Service Vehicles	
Approach streets and highways	
Interstate highways	Tennessee Department of Transportation
U.S., State marked routes	Tennessee Department of Transportation
Approach streets to gates, terminals, parking	City of Knoxville, Tennessee DOT
Circulation streets	City of Knoxville
Transit systems	
Scheduled route service	Knoxville Transit Authority, K-TRANS
Tour and charter service	Intercity and charter bus operators
Shuttle service	Private sector bus operators, K-TRANS; City of Knoxville and Tenneseee Public Service Commission (both regulatory)
Paratransit	Private sector transportation operators; City of Knoxville, Federal Aviation Administration regulatory

TABLE 3-1: 1982 WORLD'S FAIR TRANSPORTATION SYSTEM COMPONENTS (CONT.)

COMPONENT	RESPONSIBLE ENTITY FOR OPERATION AND REGULATION
Parking facilities	
Visitor	KIEE, private sector operators
Employee	KIEE
V.I.P.	KIEE
Service	KIEE
Transit terminals	KIEE
Signing system	
Traffic control	Tennessee DOT, City of Knoxville
Trailblazers	Tennessee DOT, City of Knoxville, KIEE
Radio communications	
AM/FM Radio	KIEE, radio operators
Internal	KIEE
Pedestrian facilities	City of Knoxville off-site, KIEE on-site
Marketing materials	KIEE
Traffic control	
On street	City of Knoxville
Access locations	KIEE and City of Knoxville
Enforcement	City of Knoxville

Approval Stage

Starting in the Summer of 1976, World's Fair organizers went through the process of obtaining Federal sanctioning, and BIE certification. This took approximately one year. The next two years were spent securing specific governmental and funding commitments and acquiring the site.

A major decision relative to the World's Fair transportation system was made during this interim period. Management of KIEE decided that the system should break even financially. In addition, it was also determined that, to the maximum extent possible, others in the private sector should be involved in the creation of the system to minimize KIEE financial requirements in the area. These two decisions became driving forces relative to KIEE involvement in transportation.

Planning Update

In 1979, almost three years in advance of opening day, the transportation consultant was asked to update the transportation plan to reflect decisions and commitments made during the previous two and a half years. Among these was a reduction in the site acquisition plan. The update was also intended to provide an initial KIEE transporation budget framework, plus implementation responsibilities and schedule. This plan was completed approximately two years before opening. Due, however, to a lengthy review process, it was not published for several months.

Implementation Stage

KIEE's plan implementation began in earnest in August 1981 as pressure grew from outside sources (media, potential transportation operators, tour operators primarily). Several of the necessary roadway improvements had already been initiated by the state and city prior to that time (see Chapter 4 for details). During the implementation phase the functional and financial details of the transportation plan were continually refined to reflect specific negotiation and operating decisions.

THE PLAN

Design Criteria

Transportation planning for the 1982 World's Fair was based on the following projections:

Total Attendance - 11,000,000[1]

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[1]From economic feasibility analysis.

Average Daily Attendance - 60,000[1]

Design Day Attendance (90th percentile) - 80,000[2]

Maximum On-Site Accumulation - 82½ percent of daily attendance[1]

Mode Split

It was estimated that approximately 65% of Fair visitors would come in private vehicles, 30% would arrive in some form of bus, and 5% would walk or arrive by taxi. These estimates were based on probable Fair trip origins, the day of the Fair visit, and convenience and availability of various modes for the trips. Experienced judgement played a prominent role in generating these activities.

Controlling Principles

Parking facilities were located on approach routes to the Fair to minimize circulating traffic in the vicinity of downtown and the site. The directions of approach were based on the distributions of lodging facilities where out-of-town visitors were expected to stay, and visits of those living within 100 to 150 miles of the Fair.

In 1976 an assessment was made of the adequacy of approach routes to the Fair. It was quickly determined that the planned Interstate Highway improvements, consisting of the completion of I-640 and reconstruction of the central portion of I-40, would have to be completed prior to the opening of the Fair. It was also concluded that Henley Street would have to be widened and other improvements made. Consistent with the objective to maximize residual benefits of the Fair, especially relative to transportation, all improvements were planned for their long term benefit. Some components of the transportation plan could have been improved from the Fair's perspective, but only at the expense of residual benefits.

Roadway Improvements

The need to complete these major highway improvements prior to opening of the Fair was recognized as early as 1976. Implementation of these improvements had been planned for some time in the future.

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[1]From economic feasibility analysis.

[2]Based on attendance distributions at Seattle and Spokane World's Fair.

In addition, it became evident as planning progressed that two other significant highway improvements would be needed. First, relocation and widening of Main and Cumberland Avenues was necessary to create the site desired by the Federal government for the U. S. Pavilion, the keystone of the Fair. The Cumberland Avenue improvement was needed, but had been of low priority due to cost. Second, improved access to the area at the north end of the Fair was also needed. The creation of a service road system for I-40 consisting of Dale and Ailor Avenues had been planned. This service road system design needed modification to better serve the Fair and the area to its north in later years.

The Governor and Tennessee DOT were quickly involved. They endorsed the need to complete these improvements prior to the opening of the Fair.

Operational Components

Parking Facilities. Among the most important and difficult to tie down was the parking component. Located between a major university and downtown, there was little opportunity for the Fair to utilize parking in those areas during the week. However, both areas offered substantial additional parking on weekends. Sites adjacent to the Fair were identified for temporary parking. Potential sites ranged from as few as 200 to as many as 6,000 spaces, depending on the degree of cooperation and funding levels which might occur at the time of implementation.

Few potential full-time parking lot sites appeared to be available within walking distance of the Fair. The Fair organizers and planners thus perceived a need for remote parking facilities to meet projected design day demand, despite knowledge that remote facilities at previous fairs had been underutilized by visitors. Proposed locations for remote facilities changed frequently during plan updates, primarily due to the lack of clearly desirable sites and negotiations with owners.

Parking facility plans also were modified during the implementation phase on the basis of negotiations with operators, and KIEE's break-even policy and an emphasis on non-Fair provision of parking. KIEE did establish a daily parking fee for "official" parking facilities which it hoped would become the price for World's Fair parking. This decision was made without adequate analysis of its impacts. Insufficient time was available for the analysis before negotiations with parking lot operators had to begin. This shortcoming in the planning process led to an ultimate imbalance between parking demand and supply (see Chapter 5 for more details).

Tour Buses. The Knoxville World's Fair was the first to conduct intensive marketing targeted at the tour industry. As a result, it became apparent by mid 1981 that a large component of the "bus" transportation serving the Fair would be tour buses. Only relatively small numbers of tour buses (5 to 8 percent of attendance) had been anticipated based on the experience of prior fairs. Extensive ticket sales to tour operators necessitated special provisions for tour buses.

Instead of a relatively small tour bus parking area near a gate, a full scale terminal and remote parking facilities for tour buses were planned. Because this had never been done before, a number of the major tour operators objected. Substantial pressure was placed on KIEE to provide nearby bus parking, even though KIEE's tour department estimated that more buses would arrive regularly than KIEE could adequately accommodate near its gates. In the end, the choice was between providing convenient parking for tour buses at the expense of auto parking, and having a tour bus terminal with remote bus parking. The latter option was chosen to achieve what was felt to be the proper and necessary balance in convenience to visitors using the two modes.

Shuttle Buses. Shuttle buses were also expected to be a major component of the Fair transportation system. It was anticipated that numerous visitors would stay in the Gatlinburg/Pigeon Forge area, a Smoky Mountain tourist area 40 miles from Knoxville, with over 20,000 beds. This concentration of potential Fair visitors, indicated financially successful bus operations could probably be established, if they offered frequent headways to attract passengers. Shuttle services from other region lodging areas were expected.

The plan anticipated all shuttles would be run by non-Fair organizations based on the policy of maximum involvement of other private sector entities in transportation. Later decisions reinforced this approach and determined that KIEE would not control or play a major coordinating role in the establishment of shuttle service (see Chapter 7).

The fact that KIEE did not undertake a coordinator role, combined with the Tennessee Public Service Commission's blanket approval of nearly all requests for shuttle bus operating authority, resulted in an excess supply of service over demand. Consequently, few shuttle bus operations were financially successful. If a cooperative effort by KIEE, the City of Knoxville, and the Public Service Commission had been made to coordinate shuttle operations, based on specific planning by KIEE, both service and the operators financial success would have been improved. (See Chapter 7 for more details.)

Scheduled Route Service. The 1979 plan incorporated suggestions for scheduled route service. It was anticipated that this would be operated by K-TRANS. However, by 1981 K-TRANS had run into increasing deficits and severe financial constraints imposed by the City.

The Knoxville Transit Authority directed K-TRANS to implement no service increases unless there was certainty that they would break even or be profitable. Ultimately K-TRANS made some service changes consisting mainly of adjusting headways and hours of service on existing routes. No new routes or route extensions were added for the Fair.

Street Operational Changes. The transportation plan and 1979 update contained no recommendations for street operational changes other than those related to physical improvements. During the implementation phase, it became apparent that some minor changes would be needed.

The City planned to implement a one-way street system in the eastern section of Ft. Sanders in the 1970's, but had never requested City Council approval for the change. The need to implement these changes was perceived to be critical by many during the six months preceding the Fair. These and a few other one-way street changes were implemented, after discussions by the City of Knoxville Engineering Department, and the Tennessee DOT regional traffic engineer. Temporary parking restrictions, taxi and passenger loading zones, and other such changes were undertaken by the City as part of a special World's Fair preparedness program.

Signing. Initial planning and the 1979 plan included a trailblazer system to direct motorists to the Fair parking facilities. Directional signing on Henley Street was revised to reflect new (temporary) access routes to I-40 and I-75. Technical details of this program were worked out in late 1981, but administrative details were not completed until two weeks before Fair opening. Only through close cooperation between KIEE, the City, and Tennessee DOT officials was this program successfully planned and implemented.

Most of this was done during the four months prior to opening day. Had detailed planning of signing started about one year prior to opening of the Fair, it would have made this "rush job" much easier. It should be noted, however, that installation of ground-mounted signs was always scheduled for the last possible time prior to opening to minimize loss of signs to souvenir hunters and vandals.

Radio. Two forms of radio communication were planned. One consisted of utilizing the 530 AM radio transmitter owned by the Tennessee DOT formerly used for broadcasting traffic advisories to motorists during Interstate highway construction. During the Fair, advisories were to be given to motorists coming to the Fair, directing them to less congested approach routes and parking lots.

The second form of radio information was to be less frequent reports on local AM and FM radio stations. These radio information programs where put into operation. The full-time 530 AM broadcasting proved to be unnecessary because neither traffic nor parking ever became congested. For the same reason, local commercial station transportation reports were of little need or interest.

Marketing and Public Information. Additional public information was needed to advise Fair visitors of their transportation options. Much of this information was disseminated in brochures available through numerous outlets frequented by tourists.

Traffic Control. About two years prior to opening of the Fair, the City Police Department began work on a traffic control plan. This was done almost entirely by police personnel, and was based on fears that the Fair would generate six months of serious traffic congestion. KIEE's transportation plan made mention of traffic control efforts, but assumed that specific details would be worked out by the police with input from others.

The Police Department plan called for full-time traffic control at over twenty intersections. These locations were selected based on problems which had occurred in the past. No other analyses were utilized in this selection.

Due to City budget limitations, the Police Department's request for additional personnel to staff the intersections was not approved. This caused the Police Department to review its plans. By that time, a Traffic Committee, including representatives of the Police Department, KIEE, the City Engineering Traffic Division staff, Tennessee DOT, and Tennessee Highway Patrol (THP) had been established and was meeting regularly. Traffic control concepts and plans were discussed, although no firm conclusions were reached. Subsequent agreements were made between the City Police Department, THP, and KIEE regarding responsibilities. The City would provide traffic control at intersections where needed, and would enforce traffic regulations. THP would patrol the interstates and provide helicopter assistance in emergencies. Parking and bus terminal operators would provide traffic control personnel at access points to these facilities.

CONCLUSIONS

For the most part, the planning process appears to have been effective until the implementation phase began nine months before opening the Fair. An exception was the decision made three years earlier by KIEE management that the transportation system was to break even financially. This decision was made without sufficient understanding or evaluation of its ultimate consequences.

KIEE's own transportation implementation process began only nine months prior to opening of the Fair. It is the general consensus of most involved that implementation should have started about three months earlier.

During the implementation process, outside pressures and unstable management decision processes, and KIEE's approach to management through response to crises, absorbed much time that might have been devoted to analysis of impacts of various decisions. Because implementation started late, there was little time for in-depth analysis of consequences as the plan was refined or modified during implementation.

While the transportation system ultimately operated far better than expected, limited financial success was achieved by parking and shuttle bus operators. While additional planning may not have turned losses into profits, the extent of financial loss may have been reduced.

CHAPTER 4

ROADWAY IMPROVEMENTS AND OPERATIONS

As mentioned previously, one of the main motivations for having a World's Fair in Knoxville was to achieve long term residual improvements in the downtown area. One of the most crucial of these was improvement of the I-40/I-75 downtown interchange dubbed "Malfunction Junction" and famous throughout the region for its constant traffic tie-ups. The future vitality of downtown depended upon improved access, which was equated to improving "Malfunction Junction". Thus, the objectives of Fair organizers and the City were to implement as many previously planned roadway improvements as possible to improve access and circulation within the downtown area and to improve access to the Fair site to promote residual development after the Fair was over.

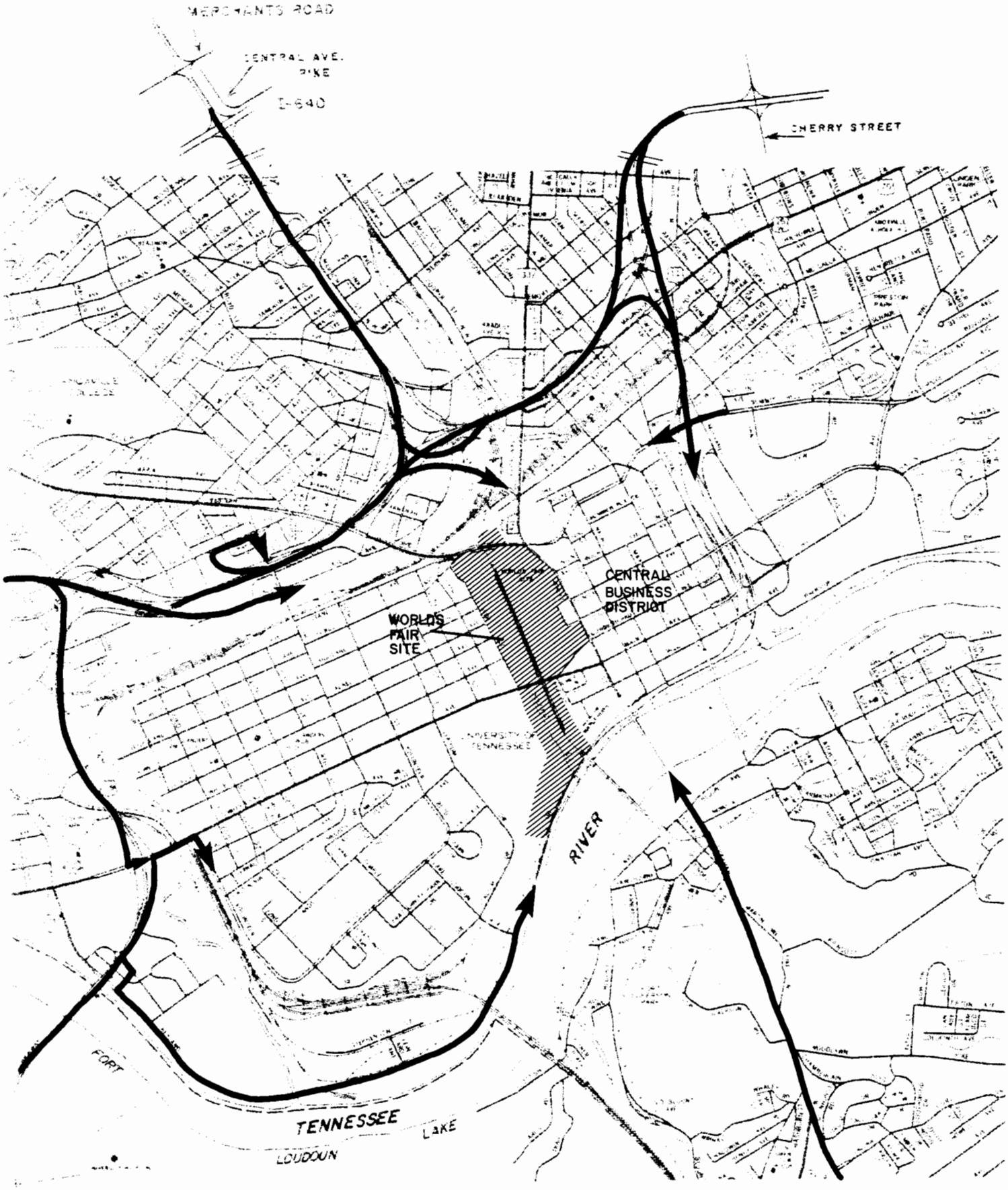
World's Fair Presence. Many feared the Fair would create six months of constant traffic congestion. Knoxville has a taste of this condition five to seven times per year in conjunction with football games at the University of Tennessee's 94,000 seat Neyland Stadium, immediately adjacent to the Fair site. While the City could endure five to seven days of this condition annually, six months of such conditions would have been intolerable and caused the Fair to fail. It was this fear that strongly motivated Fair organizers and the City and State to take an aggressive posture in implementing planned roadway and highway improvements prior to the opening of the Fair. Fair planners strove to provide good access to the Fair and its terminal and parking facilities while maintaining existing levels of traffic service on central area streets.

PREVIOUSLY PLANNED ROADWAY IMPROVEMENTS

Table 4-1 contains a list of roadway improvements which had previously been planned for Central Knoxville.

Interstate Highways

The most important Interstate improvements constructed under contract to the Tennessee Department of Transportation (TDOT) were the completion of I-640 and the reconstruction of I-40 between Gay Street and Papermill Road (see Figure 4-2). Access to the Fair would have been very congested



MAJOR APPROACH ROUTES
FIGURE 4-1

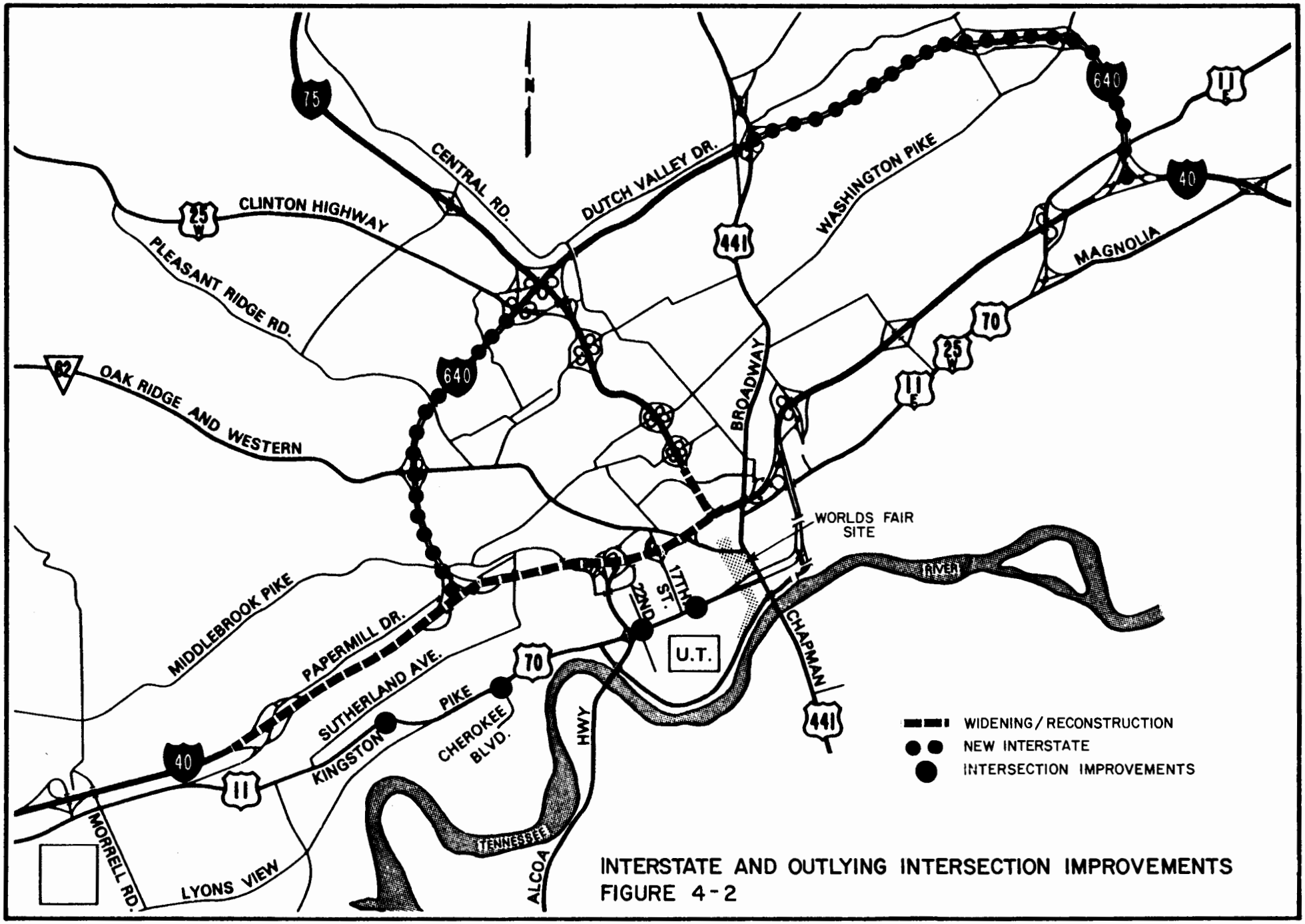
TABLE 4-1

ROADWAY IMPROVEMENT PROJECTS AFFECTING FAIR ACCESS

PROJECT	IMPACT RELATED TO FAIR
Previously Planned But Advanced In Scheduling For Fair	
I-640 construction completion	Central area bypass route.
I-40 reconstruction and widening	Increase freeway capacity.
I-40 ramp changes	Increase ramp capacities; spread out CBD access.
Henley Street widening	Increase capacity; reduce driveway access.
Eastern Ft. Sanders one-way street system	Increase roadway capacity and curb parking potential.
Blackstock Avenue construction	Improve access to area near I-40/I-275 interchange area (North Fair Gate).
Previously Planned and Scheduled for Completion Before Fair	
Kingston Pike intersection improvements	Remove bottlenecks on major artery.
Cumberland Avenue-16th Street left turn lane	Remove bottleneck on route to UT, Fair, and CBD.
Signal system computer control	Decrease delay at signals, facilitate progressive traffic flow.
Three new CBD traffic signals	One of these signals facilitated shuttle bus movements.
Implemented To Meet Special Fair Needs	
Reconstruct and realign Cumberland and Main Avenues between Henley and 11th Streets	Provide adequate site for U.S. Pavilion; reduce separation of north and south sections of Fair site.
Resurface nearly all CBD streets and replace pavement markings with some modification	Improve appearance and driving quality; increase intersection capacity.

TABLE 4-1 (Cont.)

PROJECT	IMPACT RELATED TO FAIR
Replace 500 street name signs; add block address numbers	Facilitate tourists' finding way in CBD.
900 regulatory signs	Provide adequate instruction to traffic.
Update CBD lighting on selected streets	Increase pedestrian security.
Replace 27,000 square yards of sidewalk	Provide first class sidewalk system for greater pedestrian activity.
Add pedestrian signals at selected locations	Provide adequate pedestrian protection.
World's Fair trailblazer signing (over 80 locations)	Provide directions to visitors desiring to reach Fair.
Additional one-way streets 11th Street, Poplar Street, Heins Street, Tulip Street, Blackstock Avenue, Ramsey Street	Facilitate circulation near Fair; provide adequate capacity on approach to tour bus terminal.
Three new traffic signals	Positive control at intersections with major traffic increases.
New taxi, passenger, and bus loading, no parking zones	Facilitate necessary curb usage.
Blackstock Avenue "missing link"	Provide adequate route for tour buses to reach north terminal and gate.
Temporary freeway ramps I-40 at north gate I-275 at north gate Business Loop	Increase access to Fair, downtown, Coliseum area parking.



INTERSTATE AND OUTLYING INTERSECTION IMPROVEMENTS
FIGURE 4-2

without these $180 million in improvements. In addition, modification of freeway access in the reconstructed section of I-40 both increased ramp capacity and spread out access to the central area. It also facilitated access to the north side of the Fair site where much of the Fair parking and the tour bus terminal were located.

Other State Routes

TDOT also made improvements on two state highway routes. The most important was the widening of Henley Street through downtown (see Figure 4-3). This project had all but been abandoned in the State Transportation Improvement Plan due to the difficulty in assembling the necessary right-of-way. However, when the City made an offer to purchase the necessary right-of-way as part of its acquisition of the Fair site, TDOT was able to commit to construct this improvement. This would not have been possible without the impetus of the World's Fair.

The second state highway to receive improvements was Kingston Pike/ Cumberland Avenue. Even though it is a less important route to downtown, it was felt this road would experience volume increases due to more east-west traffic during the Fair and the closing of the Clinch Avenue bridge.

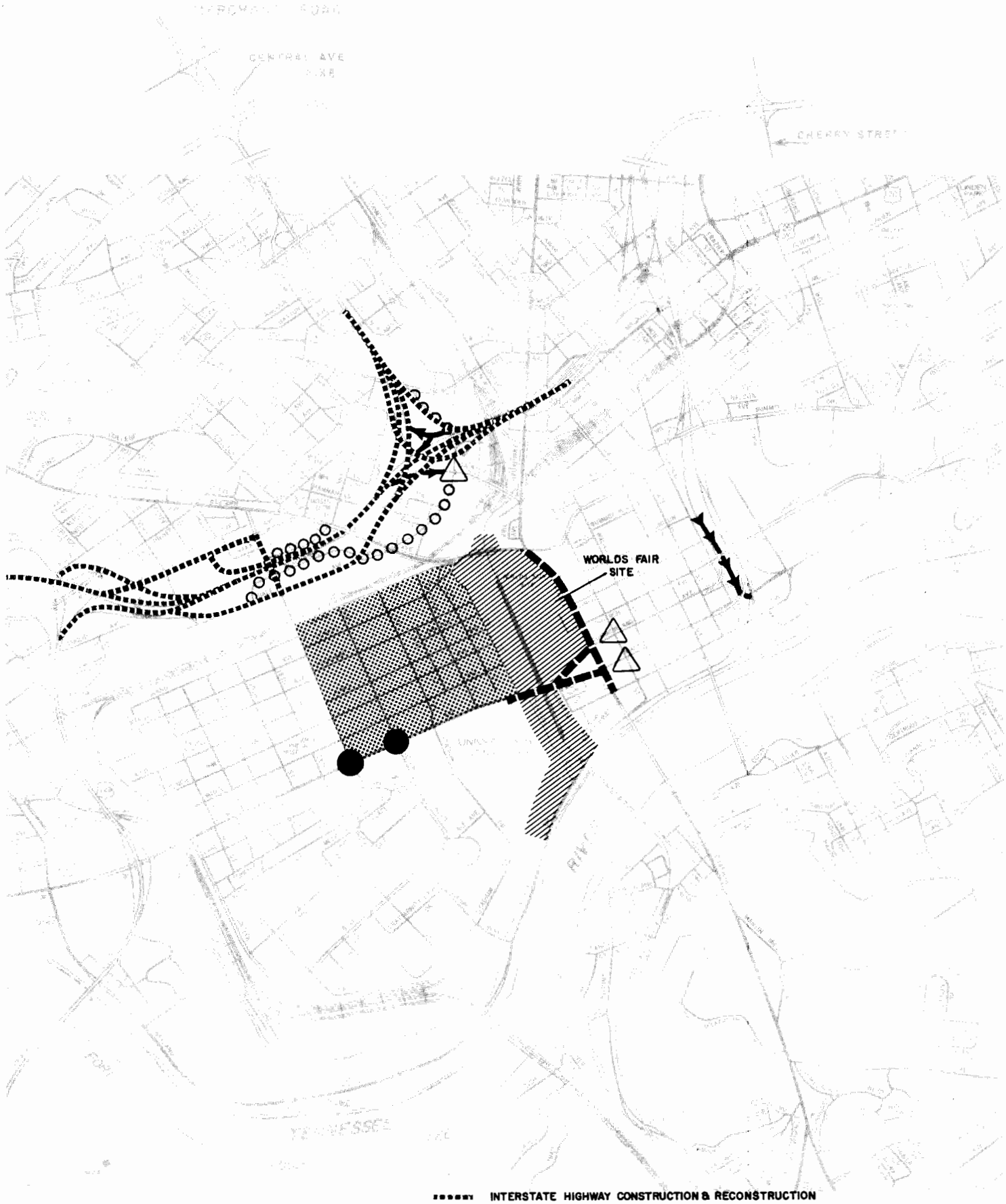
Three intersection improvements were funded with a combination of Federal, State, and local funds. They primarily involved widening for left-turn lanes at bottleneck locations.

Traffic Signal Computer Control

A computer control system for Knoxville's traffic signals was to be implemented prior to 1982. Its start up at the beginning of the Fair helped to reduce traffic delays, particularly on radial streets leading to and from downtown. In addition, many of the downtown traffic signals were modernized to meet current standards and improve backup control.

Additional Roadway Improvements Required for Fair

The other important roadway improvement was the one block "missing link" of Blackstock Avenue leading to the north bus terminal. This block had been left out of the I-40 improvement program because it was not felt by the State to be necessary to complete the area street system and right-of-way acquisition could not be achieved by TDOT. However, this link was necessary for successful operation of the tour bus terminal. Therefore, KIEE, the City, and TDOT cooperatively achieved its implementation. The City purchased the right-of-way, KIEE paid for railroad track relocation and modification of an overpass bridge structure, and TDOT paid for roadway construction.



LOCAL ROADWAY IMPROVEMENTS
FIGURE 4-3

Also, Cumberland and Main Avenues were reconstructed and realigned between Henley Street and 11th Street to provide a satisfactory site for the U.S. Pavilion. This also enabled the shortening of a bridge between the north and south portions of the Fair site which was split by the Main-Cumberland one-way pair. Other improvements are listed in Table 4-1 and shown in Figure 4-2.

Adjustment of Scheduling Priorities

Table 4-1 shows projects whose implementation schedules were advanced due to the Fair. They were achieved through cooperative and unified efforts by Fair organizers, the City, and TDOT. In cases where right-of-way or other factors had precluded implementation, the Fair and its unified support were successful in achieving implementation.

One such project was the designation of a one-way street system in the eastern portion of Fort Sanders which had been resisted by the community for over five years. The potential for increased curb parking and reduced traffic congestion during the Fair played a part in overcoming resistance and achieving this long awaited change.

Other projects included the resurfacing of all downtown streets, restriping of downtown streets with special turn lanes to increase traffic capacity, improvement of CBD lighting, replacement of CBD street name signs, and comprehensive upgrading of downtown area sidewalks. The civic pride which these projects fostered led to the creation of some private sector programs for downtown improvements, including the planting of over 100 trees and general face-lift efforts.

IMPROVEMENT SCHEDULE

Most projects were constructed according to the implementation schedule already established in the mid 1970's. The City of Knoxville desired to complete all roadway construction by the end of the 1981 construction season.

The exception was the construction of I-640 and reconstruction of I-40. This was originally intended to be a ten year project. TDOT carefully scheduled construction under as many as 28 different concurrent contracts to expedite completion. The completion of I-640 and the I-40 reconstruction were both completed on schedule prior to the opening of the Fair.

It is important to note that the Fair's financing package included a $30,000,000 loan from a consortium of commercial banks. One of the conditions for obtaining this loan was the completion of the I-40 reconstruction prior to the opening of the Fair. This commitment had to be made in writing by the Governor of Tennessee with monthly progress reports to the bank consortium. If progress had been delayed, the banks could have withdrawn their funding commitment at any time. TDOT and the State Government were aware of this commitment and, as a result, were extremely aggressive in expediting construction activity.

In some instances, the City, State, and KIEE exchanged traditional roles to expedite implementation. For example, some signing on city streets was done by State crews. Another example was installation of temporary signals by the City during the I-40 reconstruction project. A third example was funding and construction of related minor street improvements by KIEE.

TEMPORARY AND SPECIAL IMPROVEMENTS FOR THE FAIR

The Blackstock "missing link" roadway project has already been mentioned as an example of temporary or special roadway improvements needed for the Fair. In addition, four temporary ramps were constructed on freeways.

Because the I-40/I-275 interchange ramps to Henley Street were to be constructed in a subsequent project phase after the Fair, no ramps were available to provide direct access to the downtown area via Oak Avenue/ Broadway/Henley Street. In addition, there were no convenient entrance ramps to return traffic from the north bus terminal and parking lot areas to the Interstate highways (exit ramps were available).

KIEE, City, and TDOT staff recognized the need for additional ramps and cooperatively achieved their construction. It was possible to construct an additional off-ramp from eastbound I-40 plus on-ramps to westbound I-40 and northbound I-275, although the on-ramps could not meet normal design standards. Fortunately stubs for future ramps were available to tie into and TDOT was able to obtain approval from the Federal Highway Administration to construct these as temporary ramps for the Fair. Initially TDOT asked KIEE to pay for paving the ramps, since they were felt to directly benefit the Fair. However, TDOT later realized that these ramps would be beneficial to downtown traffic and absorbed the cost.

An additional exit ramp was constructed from the southbound Business Loop to Hill Avenue east of downtown to provide increased access to over 4,000 remote parking spaces in the Coliseum area. Because this ramp would be of marginal need after the Fair, and because it did not meet normal design standards, it was agreed that KIEE would pay for the construction of this ramp.

Of the four ramps, the three on I-40/I-275 are to be retained until the subsequent I-40 construction phase, which will provide a direct access connection into Henley Street. The Hill Avenue ramp is to be removed after the Fair. It was closed to traffic in September, 1982.

OPERATIONS

Street Operational Changes

Several changes in street operations were made. Temporary changes included street closures, parking restrictions, taxi zones, bus stops, and passenger loading zones. Permanent changes include the creation of new one-way streets and new traffic signals.

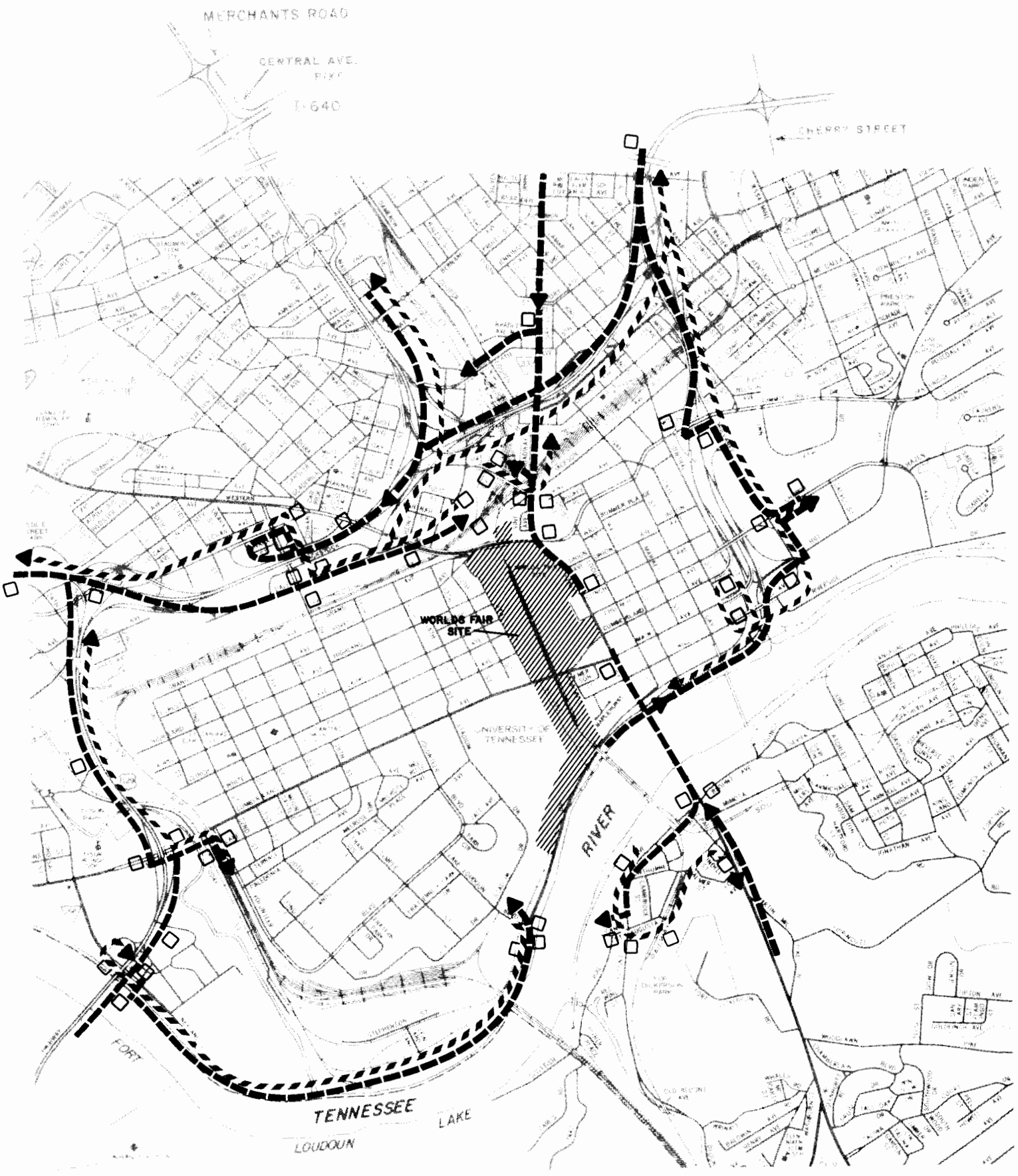
The closing of the Clinch Avenue bridge between Henley and 11th Streets during the Fair resulted in a reduction of traffic penetrating the Fort Sanders area. Its closing was temporary, but may be made permanent if redevelopment plans for the World's Fair site necessitate this.

Signing

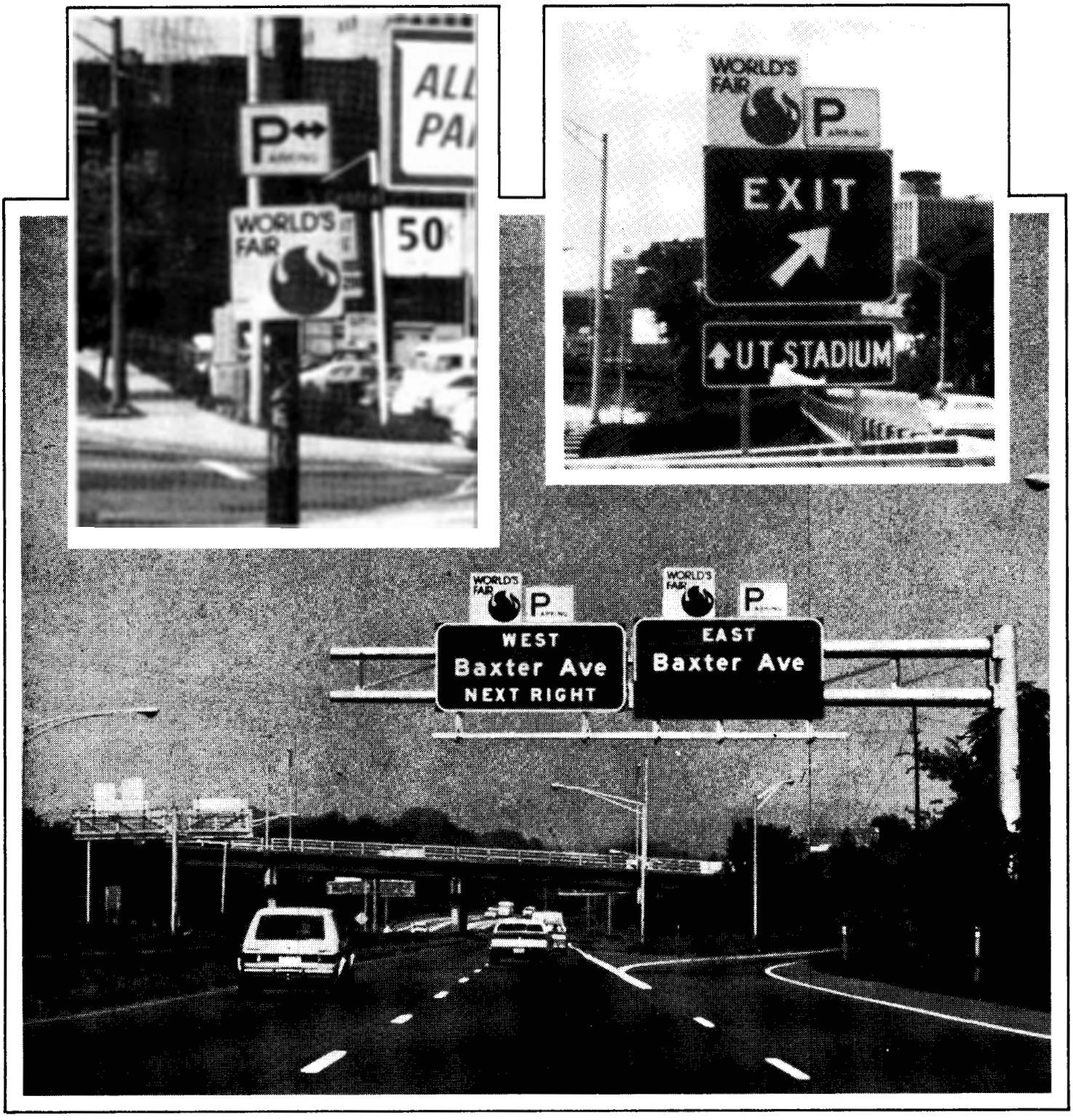
Trailblazers. KIEE devised a "trailblazer" signing system to direct motorists to Fair parking lots and terminals. TDOT developed the design and KIEE specified locations and messages. (See Figure 4-4) Examples of these signs are illustrated in Figure 4-5. They were installed by TDOT at over 80 locations along approach routes to parking lots and terminals. The City paid for signs installed along city streets. Maintenance of the signs was shared with TDOT responsible for signs along state highways, and the City responsible for signs along city streets.

The trailblazer signs proved to be very effective in directing motorists to desired locations. However, two problems developed:

1) Starting the first day after installation, ground-mounted World's Fair logo signs were stolen. Attempts to modify mountings to be more tamper-proof proved largely unsuccessful.



TRAILBLAZER CONCEPT MAP
FIGURE 4-4



EXAMPLES OF TRAILBLAZER SIGNS

FIGURE 4-5

2) Where several successive freeway exits were signed with trailblazers, most motorists used the first exit. This resulted in an uneven distribution of traffic and parking lot utilization. While this did not cause traffic congestion or parking lot overflows, it is noteworthy. Attempts to spread distribution of Fair traffic over successive exits by posting signs announcing Fair access at the next several exits also proved ineffective. Clearer signing or a different concept indicating several choices for exiting might have improved traffic distribution.

Traffic Signs. The City of Knoxville installed approximately 900 regulatory signs, most dealing with parking prohibitions and limitations, as part of its World's Fair program. Also 500 street name signs were installed. This signing proved to be adequate and resulted in little violation of regulations as long as enforcement continued (parking violations became common when enforcement was relaxed). TDOT revised its directional sign system where it had existed, primarily on Henley Street, to provide adequate directional information. Overall, the signing was quite effective. However, some additional overhead signing at locations where major Fair approach routes turned corners might have helped, such as at the entry to Blackstock Avenue from Dale Avenue.

Resulting Operations

Traffic. As expected, the completion of I-640 and reconstruction of I-40 resulted in a tremendous improvement in traffic conditions along Interstate 40 near downtown. Congestion that had been persistent throughout much of the day totally disappeared in the reconstructed section of I-40, which was widened by one to three lanes in each direction. This section of I-40 operated at Level of Service A for virtually all times of the day prior to the Fair and access to and from the central area of Knoxville was at Level of Service A or B during peak periods.[1] Levels of service on most of the other downtown streets were at A, B, or C, with the exception of Summit Hill Drive west of Henley Street. Because of the constricted width of the viaduct west of Henley and the short widened section approaching Henley Street, inadequate capacity was available on that approach. That intersection continued to operate at an undesirably low level of service during peak periods prior to the Fair. However, once the Fair opened and it carried heavier traffic volumes, its level of service was not lowered.

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[1]Free flow with unrestricted maneuverability or smooth flow with occasional restrictions of maneuverability.

During the Fair, peak period traffic conditions appeared the same as prior to the Fair. Part of the reason was that the inbound peak movement to the Fair occurred after the normal morning peak hour. Outbound Fair traffic volumes during the evening peak were low enough so that they were not noticed. Only about eight percent of daily visitors left the Fair during the PM street peak hour. Counts on I-40 and I-75 indicated that volumes shortly after the opening of the Fair were only 6.8 percent above those just prior to the opening of the Fair (8 hour counts). Traffic volumes on city streets were not available between completion of the Interstate project and opening of the Fair. However, observations indicated there was little change in traffic volumes, at least on the downtown side of the Fair.

One area which did experience substantial volume increases during the Fair was Dale Avenue and Blackstock Avenue. These streets provided access to over 2,000 parking spaces and the north bus terminal where all tour buses unloaded and reloaded. With as many as 750 tour buses (275 daily average) trying to reach the terminal, most around 10:00 a.m., some congestion did occur. On the highest bus volume days, traffic actually backed onto I-40 and queued for approximately 1½ miles from the terminal. Once tour operators determined they could not all reach the terminal at the same time, they began spacing their arrivals. After the first several weeks of the Fair, queues backing onto the Interstate were extremely rare. When long queues did occur, they happened on Saturdays, the peak bus and attendance days at the 1982 World's Fair.

Signing. Some drivers lost their way while trying to follow trailblazer signs. This happened primarily because ground mounted signs were periodically stolen and was aggravated by the fact that informal signs at souvenir stands proliferated along some approach routes, resulting in reduced trailblazer sign target value. Had the City more strongly restricted souvenir stand signing along public streets, this minor problem would have been reduced.

Traffic Control. The key to successful operation of the World's Fair transportation system was the high degree of planning cooperation between the Police Department, the City, the State, and KIEE transportation staffs. The Police were instrumental in dispersing momentary traffic blockages, expediting traffic flow, and providing traffic direction where needed. During the first week of the Fair when initial operations were being refined, the State Police cooperated by leaving the State Highways to work on local streets.

Coordination. The Traffic Committee, organized by the Police Department, proved useful as an effective forum for various traffic issues and provided a means for coordinating and communicating on a regular basis. Initially meetings were held monthly, but later became weekly events. This was yet another example of the close and necessary coordination between the City, State, and KIEE organizations.

Transit. Because traffic conditions were not aggravated by the Fair and were actually improved in some cases as a result of road improvements, no major adjustments due to traffic congestion were needed to K-TRANS operations. While service hours were extended, only a few extra sections on routes were added. One route was restructured and a few were re-routed.

Taxi Zones. On-street bus, taxi, and passenger loading operated efficiently during the Fair. Space for 35 taxis was provided adjacent to the four Fair gates in response to heavy pressure from taxi operators. Initially all taxi zones were occupied during peak outbound Fair visitor periods. However, after the first several days of the Fair, taxi operators confirmed that demand for their services did not exist in great quantities. Rarely was there a need for more than two or three taxis to be stationed at each gate. Most taxi business was generated adjacent to bus terminals resulting from people either missing their buses or wanting to depart much earlier than their scheduled bus departures.

If anything, special zones for taxi and passenger loading may have been oversupplied. This was due in part to almost unlimited issuance of licenses to taxi operators as a result of the mistaken belief that demand for taxi service would be extensive.

CONCLUSIONS

The level of traffic service on roadways in the central area of Knoxville was better than expected during the Fair. A few roadway improvement projects were implemented that would not have been made had it not been for the Fair. Looking back, those who were involved felt they would not make significant changes in what was done to improve roadways and traffic operations if challenged with another World's Fair. Operations which were initially inconsistent with needs were adjusted during the first week of Fair operations. With the exception of tour bus queuing, all adjustments were made successfully by the tenth day of the Fair.

In retrospect, the impact of tour bus queuing on Dale and Blackstock Avenues (and occasionally I-40) could have been alleviated in one of two ways: (1) schedule arrivals of buses in a manner similar to the scheduling done for departures (see Chapter 6), or (2) provide a much larger terminal, perhaps double the size of the north bus terminal. Chapter 6 addresses this issue in more detail.

Parties involved in the Knoxville experience agree that all organizations must be unified and strongly coordinated in their efforts when major roadway improvement programs must be completed prior to the opening of the Fair or other major events. Success was only possible in Knoxville through the coordination and unification of efforts plus willingness of

gency decision makers to delegate functional decision authority to staff level personnel or for that authority to be assessed. For example, although some final decisions on signing and one-way streets were not made until 10 days prior to opening day, delegation of authority to the City Engineer and Traffic Engineer made it possible for even these decisions to be implemented prior to opening day.

CHAPTER 5

PARKING

Beginning with early publicity regarding the possibility of a fair in Knoxville, the public feared six months of the same traffic congestion and double-parking which occurs each time the University of Tennessee has a home football game. The 1982 World's Fair site was located just west of downtown and just east of Fort Sanders and the University of Tennessee. Areas on both sides of the Fair had supplies of parking with enough demand to utilize nearly all available parking spaces. The Fair site itself was too small to accommodate any on-site parking. Hence, it became obvious early in the planning process that it would be a challenge to secure sufficient parking.

It was also concluded that providing adequate parking for the Fair would require extensive use of temporary parking facilities. An amount of parking nearly double that needed to handle the design day of 80,000 was developed in official and unofficial lots for the Fair. This resulted in a very desirable parking situation for Fair patrons but financial success for very few parking lot operations.

MAJOR POLICIES

Both KIEE and the City of Knoxville established policies which ultimately affected the World's Fair parking system.

KIEE

KIEE recognized the need for about 13,000 parking spaces to be available for World's Fair visitors on the design day.

Key Decisions. By 1980, KIEE had made three decisions critical to the final outcome of the parking system:

1) Virtually all parking not existing prior to the Fair would be in temporary parking facilities unless entities other than KIEE decided to establish new permanent facilities.

2) To the maximum extent possible, organizations other than KIEE would provide parking for the World's Fair.

3) Due to its limited financial resources, KIEE would need to break even financially relative to the transportation system. This included all elements of the system, not just parking.[1]

The first two policies were easily implemented. In the end, however, KIEE had to contract about 7,500 spaces to ensure they would become dedicated World's Fair parking facilities.

The third decision had major consequences. A key result was a daily visitor parking fee of $6.00, (including shuttle) which was based on balancing total costs and revenues of the transportation system. Since parking was the only significant revenue generator in the transportation system, parking fees had to cover costs for KIEE, city roadway improvements, parking lot paving, shuttle bus services, employee and VIP parking, a radio system, operating equipment, and other system elements. The $6.00 fee was set as a firm price for all "official" fair parking lots and also had the effect of establishing a benchmark for unofficial lots.

Impact. Local entrepreneurs, encouraged by reports of parking shortages during the Fair and the potential profits from parking cars at $6.00 each for 184 days, began making preparations to enter the parking business late in 1981 and early in 1982. The result was land clearance to create parking lots far in excess of the supply that was needed or could be financially supported.[2]

As a result, nearly all parking operators, including KIEE and its contract operator, lost money on parking. While no specific studies were made, it is doubtful that the $6.00 daily fee drove away many visitors. In many instances parking operators lowered their prices due to the excess parking supply.

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[1]This decision was made 2 to 3 years before the Fair opened. It was also made with the knowledge that parking had generally been unprofitable at previous World's Fairs, especially where all costs had to be amortized during the Fair.

[2]Most land cleared for temporary parking lots had been used for materials storage or occupied by dilapidated residential and small commercial buildings. The clearance did improve some blighted areas along access routes to the Fair.

The City of Knoxville

During the local approval process for the World's Fair, some residents of Fort Sanders, a residential area immediately west of the Fair (see Figures 1-2 and 1-3), had been extremely vocal in their opposition to the Fair. One reason given was that vehicles would be parked all over front lawns and back yards for six months, as they are for football games.

Ordinance. After much consideration and deliberation, the City of Knoxville passed a temporary parking lot ordinance regulating the land use zones in which temporary lots could be established. The ordinance also covered the design and operation of the lots. The Phase II report of this evaluation describes the ordinance more fully.

This ordinance prohibited temporary lots in single family and low density multiple-family zoning areas (R-1 and R-2). It also established a minimum size of fifteen thousand square feet for a temporary lot. Design and operating standards were established and permits required prior to construction. To prevent large areas of gravel parking lots from being left after the Fair, a reclamation bond was also required. This ordinance was passed on September 15, 1981.

Impacts. The relatively late passage of the ordinance caused local entrepreneurs to delay their decisions on whether or not to develop parking areas. Many applications were not received until the last month prior to opening of the Fair because the ordinance did not set a final permit application date. This resulted in an oversupply due to the proliferation of temporary parking lots which were developed just before the Fair opened.

Possible Improved Approach. Had the City passed this ordinance earlier and established a permit application cutoff date three to four months in advance of the Fair's opening, KIEE and the City would have been able to document the total permitted parking supply. Applicants could have been informed of the total supply and, based on this information, make a better assessment of their market feasibility.

The City could also have established a zone in which temporary parking facilities could be established. Applicants with parcels as far as five miles away from the site applied and paid a $500.00 application fee for temporary parking lot permits. As it turned out, no lots beyond 3/4 mile from the Fair achieved significant use, and none beyond 1/2 mile were successful financially. One reason no zone was considered for temporary lots was that everyone expected a parking shortage and welcomed any entry into the parking business. In addition, there was an assumption that lots far from the Fair site but on transit routes could be marketed. Politically, the City was in no position to limit speculative activity. In retrospect most agreed that the market, not a geographic zone, is still the only appropriate regulator.

Parking Operators

Rate Changes. Policy decisions made by existing parking operators had a greater effect on downtown patrons than on the Fair itself. Prior to opening the Fair, approximately 10,000 parking spaces existed in downtown Knoxville. Many accommodated monthly employee parking at competitive rates ranging from $20 to $45 depending on location. During the six months prior to the Fair, most operators instituted parking rate increases from the previous $1.75 to $3.50 for daily parking range to $4.00 to $8.00. Rates for the first one-half hour did not change during the Fair, but subsequent hourly rates were increased. As opening day approached, some operators eliminated monthly parking. Others agreed to provide monthly parking to existing customers if permits were bought in advance and some required advance purchase of a permit for the entire six months. Some provided "early bird" specials aimed at employees which consisted of 50 percent discounts on daily rates to those who entered by 8:30 or 9:00 a.m. and left by 5:30 p.m.

Impacts. These changes caused a shift in employee parking to peripheral CBD east side lots with lower rates or monthly parking contracts. As it turned out, World's Fair visitor parking usually only penetrated about three blocks into downtown in most areas. Those operators who had purged their lots of employee parking had a difficult time attracting it back. Several experienced overall revenue decreases despite the rate increases.

By the end of the Fair, some downtown parking operators were requesting others with low rates to raise their rates in an effort to make the less successful operators more competitive and profitable. At this writing prices have been reduced, but generally remain above pre-Fair levels. The Phase II report of this evaluation will document this subject further. The operators who had raised their rates and eliminated monthly parking jeopardized their long-term financial stability.

PARKING PLAN

The World's Fair parking plan was aimed at securing adequate parking space dedicated to World's Fair visitor usage and included provisions for VIP's and employees. It was based on supplementing existing parking space availability which varied depending on the day of week (weekday or weekend) and whether or not the University of Tennessee was in regular session (school or summer). Table 5-1 shows the anticipated "design day" visitor parking system need.

TABLE 5-1

DEDICATED OFF-STREET VISITOR PARKING SYSTEM

Period	Anticipated Need for 80,000 Daily Attendance	AVAILABLE SPACES	
		May[1]	Mid-Summer[1]
Weekday			
May 1 - June 11[2] and September 20 - October 31[2]	11,300	14,500	9,500
June 12 - September 19[3]	11,300	15,500[4]	10,500[4]
Weekend			
May 1 - June 11[2] and September 20 - October 31[2]	11,300	21,500[5]	16,500[5]
June 12 - September 19[3]	11,300	21,500[5]	16,500[5]

[1]Estimated

[2]University of Tennessee in regular sessions

[3]University of Tennessee in summer operation

[4]Excludes University of Tennessee campus parking used for Fair parking

[5]Includes 5,000 additional CBD spaces; excludes several thousand on-street spaces in CBD and Ft. Sanders area which were used for Fair parking.

An evaluation of existing parking usage near the Fair indicated that approximately 1,300 spaces downtown and 700 spaces elsewhere would be available on a "school weekday" when availability of existing spaces would be at a minimum. This pointed to a need for about 11,000 additional visitor spaces (including VIPs) to be provided within the World's Fair "parking system."

The intent had been to design for the 90th percentile day so parking shortages would not be experienced on more than 10 percent of the days. However, the variation in space availability was not compared with projected attendance by day. The design day parking supply was closer to the 95th percentile than the 90th since most of the top 10% attendance days occurred on weekends when parking availability was substantially greater. Early planning excluded VIP, employee, and service parking, but it was later included during the implementation process.

REALIZATION

While KIEE management had established policies to direct implementation of the parking plan, it soon became clear that the plan could not be totally implemented under those policies. While there was much private sector entrepreneurial interest in providing World's Fair parking facilities, which was evident even prior to the establishment of the $6.00 daily parking fee, each interested party had his/her own ideas regarding pricing, hours, methods of operation, etc. Also, potential parking lot sites were under very fragmented ownership which made it difficult to pull all owners and lessors together or to directly assemble the parcels under lease agreements in a short time span.

It also became evident that KIEE would have to play a major role if any degree of standardization or consistency was to be achieved at the "Official World's Fair" lots. The most difficult requirement by KIEE to sell to entrepreneurs was that all official lots beyond 1/2 mile from a Fair gate have shuttle service between the lot and a Fair gate.

It was also necessary for KIEE to become involved in order to obtain an adequate parking supply, especially in the case of two available parking facilities adjacent to Fair gates which were controlled by public agencies. One was a lot of approximately 800 spaces belonging to the University of Tennessee. The University's primary obligation is to the students and, thus, Fair parking was a secondary priority. Therefore, KIEE leased and operated the lot.

The second available facility was surplus I-40 right-of-way owned by TDOT. Since TDOT could not enter the parking business itself, it leased this land to the City with the requirement that KIEE operate the parking facility. The City signed a management agreement with KIEE because the lease did not allow the City to sublease the land. There were no monetary considerations except KIEE had to pay TDOT for paving the land. Hence, KIEE was ultimately drawn into parking lot operations despite its earlier decision to the contrary.

Through the implementation process, KIEE held its own options open as to whether it would operate the lots itself or contract the operation to others while retaining control of the land.

IMPLEMENTATION PROCESS

Visitor Parking

As it began to assemble a private sector 1982 World's Fair parking system, KIEE established guidelines for the "official" facilities. These included the $6.00 daily parking fee, shuttle transportation for all lots over 1/2 mile walking distance from a gate, operating hours starting one hour before the Fair opened and ending one hour after the Fair closed seven days a week, meeting City standards, use of "official" signs only, and standard ticketing and payment procedures.

Responsibility for assembling the parking system was given to the Transportation Services Division of KIEE. That division both sought out desirable sites and received offers of proposals for any additional sites in which there was interest. The Transportation Services Division then selected those lots it was interested in for the official system and negotiated agreements.[1] All agreements for official designation required approval of the KIEE Management Committee, a committee of the organization's Board of Directors.

Despite the initiation of negotiations in August, 1981, the first contract was not signed until December, 1981. Widespread interest resulted in the offering of four to five times as many spaces as could possibly be used. Nonetheless, potential operators had not done enough background work themselves to be confident enough in their own preparations to commit contractually to operate parking lots for six months. Most contracts were not signed until the final three months before the opening of the Fair. Several were signed during the last month, although they had been verbally "committed" prior to that time.

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[1]Lots as far as 10 miles from the Fair were offered. Overall, serious negotiations were started by KIEE on less than 20 percent of the lots offered and contacts resulted on only about one-third of those.

Sixty days prior to opening day the shape of the parking system was still uncertain. Commitments had not been made for several remote lots and there were many proposals for lots which were only marginally acceptable. The total number of spaces committed to the system (less than 6,000), was still below what had been desired. The KIEE Management Committee became impatient and did not want to wait and see if more lots within walking distance would be offered. By that time, pressure from the media, tour operators, and KIEE's own marketing department was intense. It was evident a decision had to be made to finalize and publicize the system. KIEE decided to complete the official parking system with five additional remote lots containing approximately 1,600 total spaces.

About this same time, it became obvious that there would be a substantial number of unofficial lots. These were primarily operators who felt they could not or did not want to conform with KIEE's official lot requirements. While it had been apparent as much as ninety days before opening day that there would be a few of these lots, the great majority of them began to appear during the last thirty to forty-five days. The only way for their locations and sizes to be determined was through reviews of temporary parking lot permit applications. Many lots were never offered to KIEE. In fact, some of these operators had previously indicated to KIEE that they did not want their land used for parking.

Initial Lots. Figure 5-1 shows the parking facilities ultimately dedicated to World's Fair use. These lots were all in place on opening day. There were over 16,000 total weekday spaces with approximately 10,000 more available on weekends. About 6,800 of these were "official".

Results. The over-supply caused most parking entrepreneurs, including KIEE, to lose money on parking. However, the visitor parking system easily handled the demand on all but the single highest attendance day of the Fair. Even on that day, over 102,000 people were accommodated by directing traffic from full lots to others with available space. Overall, the supply and operation of visitor parking was viewed as a success and aided in marketing the Fair to the public.

Factors. Many parking lots ceased operation during the first two months of the Fair; some lasted only days. Figure 5-2 shows facilities which closed by early summer. In retrospect, there were several factors which led to this result:

1) KIEE yielded to pressure too early in committing to its last "official" lots. These would not have been included in the system had the final decision been deferred two to four additional weeks. However, other preparations had to be made and, from a public relations standpoint, KIEE really could not have waited.

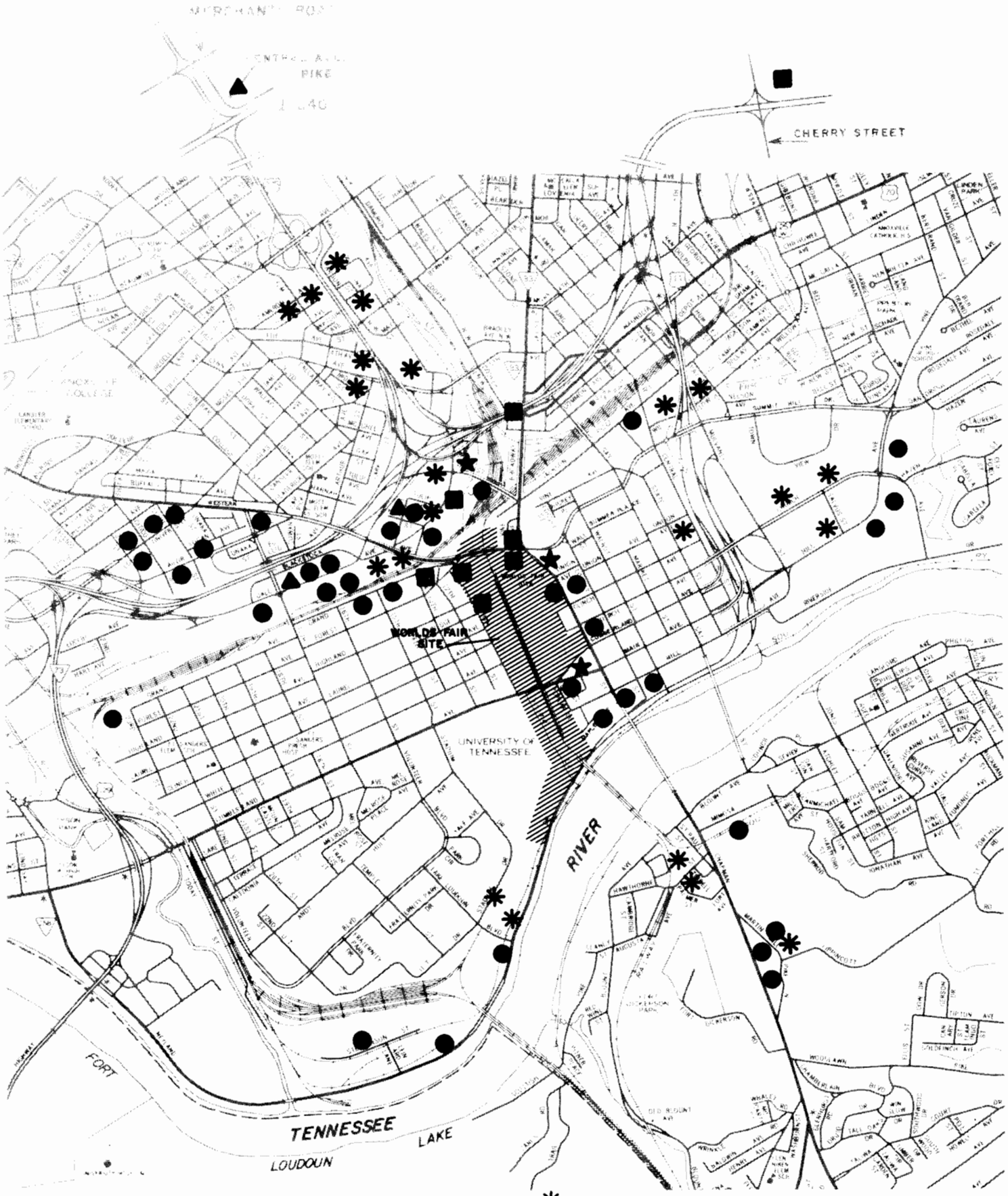
2) The City's ordinance did not have a final application date which resulted in many applications being received only one to two weeks prior to opening of the Fair. It would have been much easier to assess the situation if there had been an application deadline three to four months prior to opening day. The implications of supply and demand would have been obvious and the oversupply potential would have been reduced. Publication of the total supply of permit applications might have helped achieve a better supply/demand balance.

3) The City was late in enacting its temporary parking lot ordinance. No one was willing to commit to temporary parking lots until after the ordinance had been passed on September 15, 1981.

4) The City's temporary parking lot ordinance did not identify an acceptable geographic zone for World's Fair parking. Thus, many people wanted to improve their undeveloped land as temporary parking lots. While the clearance of substandard and deteriorated buildings was a beneficial result, it did result in a large amount of unprofitable gravel-covered land which may remain in that condition long after the Fair ends.

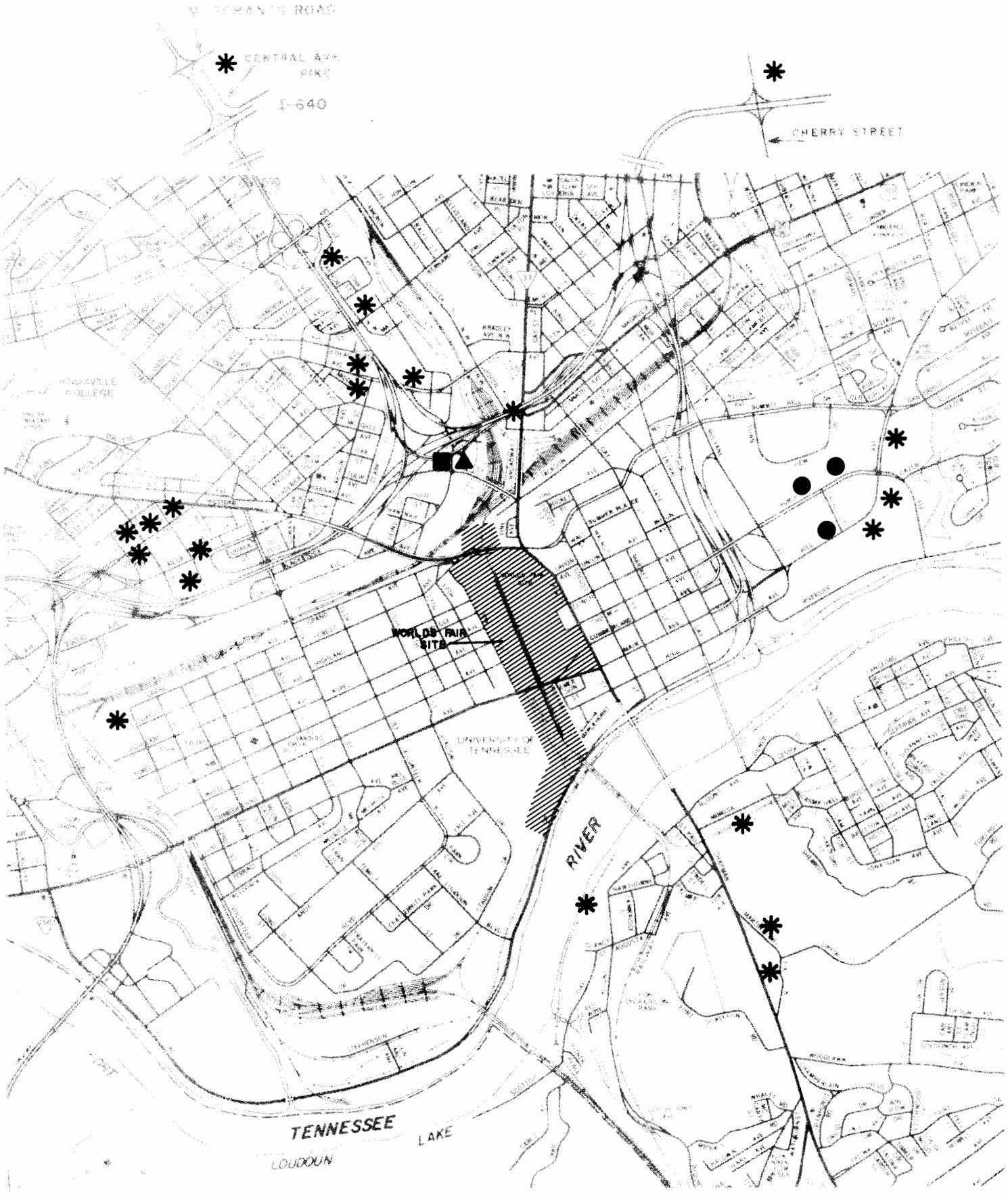
5) KIEE, in its quest to secure adequate parking for the Fair, encouraged parties with marginal locations as well as good ones. Some of these might not have entered the parking business without initial encouragement from KIEE.

6) The $6.00 parking fee, while based on KIEE's break-even desire, provided economic incentive for development of parking lots. Since local entrepreneurs did not carefully analyze the market potential, the mere existence of a high daily rate was enough to entice some of them into parking ventures. Contrary to original policy, even KIEE sustained a major loss on parking due to the oversupply. A more in-depth analysis of the $6.00 parking fee should have been conducted.



SELECTED FAIR PARKING - OPENING DAY

FIGURE 5 - 1



CHANGES IN FAIR PARKING BY MID SUMMER

FIGURE 5-2

- ✱ CEASED OPERATION
- ▲ CHANGED TO KIEE EMPLOYEE PARKING
- ● WITHDRAWN FROM OFFICIAL VISITOR LOT SYSTEM
- ■ CHANGED TO TOUR BUS PARKING

N

VIP Parking

KIEE management committed itself to provide priority parking for VIPs in connection with other commitments. The VIPs included Fair sponsors, press, corporate and international exhibitors, official designees, government officials, and special guests.

Projection of parking needs for VIPs was very difficult. It was expected that during both opening day and the first weeks of the Fair, the number of VIPs attending the Fair would be large. However, as the novelty of the Fair wore off, VIP attendance at the Fair was expected to decline. This trend did occur.

KIEE management attempted to estimate the number of permits to be issued in each category. Aside from exhibitors and "Gold Passport" holders (early sponsors), it was very difficult to estimate the number of permits to be issued.

Ultimately the decision on the number of spaces to provide for VIP parking was based as much on supply as any other factor. The Transportation Services Division was able to identify three small convenient lots totalling approximately 500 spaces which were reserved for VIP and limited employee use.

Before opening day, VIPs invited to opening day ceremonies were issued parking passes which would be accepted at no charge to them by several downtown parking operators. This allowed VIPs the option to park either in the designated VIP lots or in other nearby facilities.

On opening day, approximately 1,100 VIP vehicles were parked at the Fair. By that time, approximately 850 permanent VIP permits and approximately 100 additional one-day permits had been issued.

Press passes were in great demand during the opening week of the Fair. Distribution of these passes was virtually uncontrolled and some difficulties were experienced with over-commitment of parking spaces and widespread abuse of pass privileges. However, after the second week, VIP parking usage was very low and averaged less than 150 spaces per day.

By the end of the Fair, approximately 900 permanent VIP passes had been issued along with about 10,000 one-day passes. The supply of VIP parking spaces had been effectively reduced to approximately 300 spaces. Shortages of VIP parking only occurred on days of University of Tennessee home football games.

Despite the best efforts of KIEE management and Transportation Service Division personnel, it was almost impossible to forecast usage of VIP parking facilities. Fortunately, the estimated usage was high. It would have been more difficult if the estimate had been low and an increase in supply had been needed. An alternate approach could have been to supply passes which would permit VIPs to use other lots at KIEE's cost when dedicated VIP parking spaces were filled. This would have allowed for provision of less VIP parking supply.

The VIP parking passes were dashboard cards. Approximately a dozen different categories were issued. Cards were used rather than decals or stickers so they could be transferred between vehicles driven by the VIPs. Despite fears that these cards would be stolen or utilized by unauthorized visitors, VIP privileges were generally not abused except by the press. Only a few cards were reported stolen or lost.

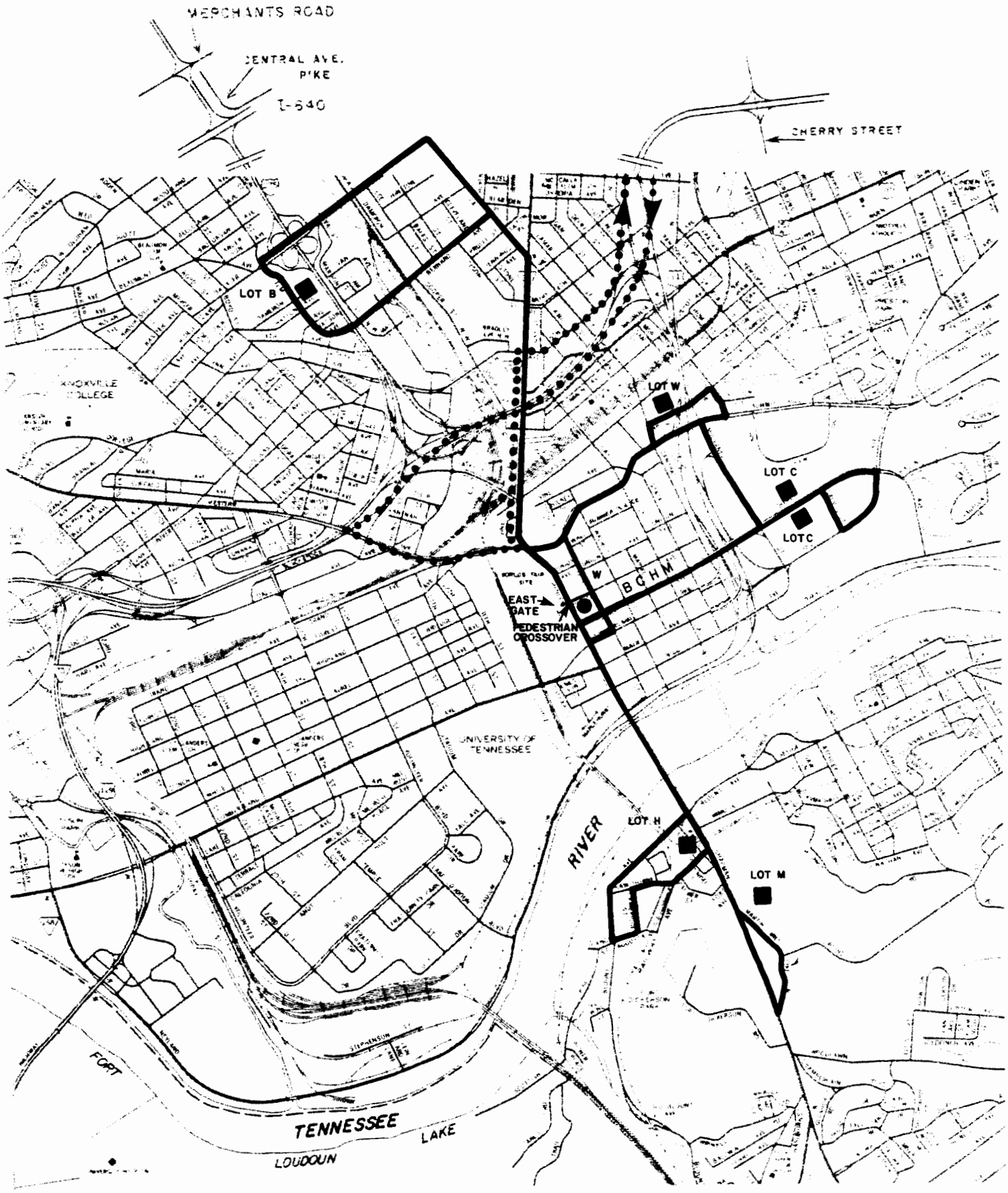
Employee Parking

Forecasts of employee parking needs were also difficult to obtain. While it was possible to roughly estimate the total number of employees of KIEE, exhibitors, and concessionaires, it was difficult to ascertain the maximum on-site accumulation of the employees. KIEE personnel charged with overseeing exhibit and concession operations contacted these organizations to try to determine employment patterns. Ultimately a very rough estimate of on-site employee accumulation was made.

KIEE Transportation Services staff then estimated that about 1,500 parking spaces would be needed for employee parking. Of these, it was anticipated that employees would find approximately 500 to 1,000 spaces in Fort Sanders or other locations within walking distance of the Fair site. The remainder would be in remote locations accessible by free shuttle service. (See Figure 5-3)

The decision to provide employee parking at a remote location was made under the assumption that the visitor parking supply would be tight. It was felt that the cost in lost revenue of providing close-in employee parking would be greater than the savings in shuttle costs.

In total, approximately 800 employee spaces were provided and KIEE made about 250 close-in spaces available for selected KIEE employees. Other KIEE employees plus those of exhibitors and concessionaires had use of 550 remote spaces about two miles east of the Fair with free shuttle service.



SHUTTLE BUS ROUTES

FIGURE 5-3

KIEE management decided that a nominal parking fee should be charged to employees to help defray the cost of providing that parking and to encourage transit usage and carpooling. This fee was competitive with prior downtown parking cost and based on the earning power of on-site employees, generally just above minimum wage.

Assignment of employees to close-in and remote parking spaces was difficult and controversial. As was expected, all long-time employees of KIEE felt they should have close-in spaces. Assignments to close-in lots were made on the basis of position and length of service. Some persons who had been employed several months prior to opening were assigned remote parking. No employees starting just before the opening of the Fair were given close-in parking.

Initially nearly all close-in spaces were occupied by employees offered spaces there. However, one lot was felt to lack adequate security and was seldom used. Persons with permits to park there sought other locations. The remote lot two miles from the site was used by about 400 vehicles daily during May. During the first month the operator of that lot, under contract with KIEE to park employee vehicles at a daily rate, encouraged employee parking by charging a daily $2.00 fee to those who had not acquired monthly permits.

As more people found free or inexpensive parking within walking distance of the site, utilization of the remote lot dropped. By August only 120 permits were sold. On September 1, the remote employee parking facility was abandoned by KIEE. All employees who wanted permits were assigned close-in parking locations. By that time, VIP parking had declined to the extent that close-in parking was available for about 450 employee vehicles (see Table 5-3).

Service Vehicle Parking

Detailed planning for service vehicle parking never was incorporated into the overall parking plan. KIEE's Operations Department had declared it would accommodate this parking in a lot behind the KIEE operations center and adjacent to the main truck docks. However, by opening day it had become obvious that the area would be too congested to permit service vehicle parking.

Once restricted parking went into effect, service vehicles had no designated place to park during the day. After a short time, prompt responses to service calls became difficult. Ultimately ten to fifteen spaces were provided in one of the employee lots for service vehicles. This seemed to resolve most daytime problems. There were no significant night (after hours) service vehicle parking problems.

OPERATION

Visitor Parking

Parking quickly became very competitive due to the excess supply of parking spaces for World's Fair visitors. Flagmen appeared on the second day of the Fair. By the end of the first week all kinds of garish signs and other high attraction devices were being used to entice visitors into parking lots, especially along major approach routes from I-40. Also within the first few days prices began to drop as operators attempted to fill their lots. By the end of the first week most unofficial lots except those in downtown were charging $4.00 per day. Some were dropping their fees later in the day to as little as $2.00. The Phase II report of this evaluation addresses price elasticity of demand for visitor parking.

Some remote lots also lowered their rates to as low as $2.00, but charged separately for shuttle transportation. Those who chose to ride the shuttle buses usually paid close to $6.00, or more if their groups were large.

Almost no lots north of I-40 were patronized to any significant level with the exception of the Baxter Avenue lots along I-275. The most heavily utilized lots were on the east side of Henley Street in downtown and along Dale and Blackstock Avenues near the north gate. However, even the KIEE official lots near the north gate did not fill. Neither did the large lot adjacent to the southwest gate. Table 5-1 shows the substantial reduction in spaces by mid-summer. (See also Figure 5-2).

With one exception, official remote lots never achieved even 50% occupancy until the peak attendance day (over 100,000) in October. Average occupancies were in the range of 30-40 percent during May. Because of the oversupply of parking, KIEE management decided in mid-May to invoke its contract termination rights on official remote lots. The effect of this would have been for KIEE to cease providing shuttle buses between the Fair and these lots. It would not necessarily have put them out of business. However, operators of these lots were able to convince the KIEE Management Committee that they had made substantial investments to create parking lots with the implied understanding that they would operate for six months and had not yet been given an opportunity to meet expected peak summer parking demands. The KIEE Management Committee cancelled the terminations.

By mid-summer, occupancy in remote lots had not increased and KIEE again transmitted termination notices. Again, pressures were brought and the notices were rescinded. At the end of September notices were sent out a

third time and the parking operators agreed to contract termination if KIEE would leave existing trailblazer and "official" parking lot signing in place. This was accepted by KIEE. The remote operators contracted with K-TRANS to continue shuttle service through the end of the Fair.

Most of the parking operators who remained in operation after the beginning of the summer made major cutbacks in staffing to minimize financial risk. Despite requirements by City ordinance and KIEE contract, many lots had no personnel to provide security after mid-afternoon when the parking fees had been collected.

KIEE contracted with a parking management company to operate the north and southwest (UT) lots it had leased. This was done primarily to reduce the reporting and cash handling load on its Finance Department and Transportation Services Division, to reduce early cash flow commitments from KIEE's treasury, and to acquire additional experienced professional assistance in running KIEE's parking operations. The arrangement worked well for KIEE with the operator and Transportation Services staff working together to maximize benefits to both organizations.

Employee Parking

As mentioned above, space assignment was a major internal political issue for KIEE. Parking permit sales for close-in lots were slow and most staff ultimately moved into underutilized VIP parking space adjacent to the Fair. Results have been summarized in Table 5-2.

The employee parking experience at the 1982 World's Fair was similar to that at other Fairs. The relatively low wage scales for Fair employees made even a $20 monthly fee expensive. Nearly all hourly employees successfully found free parking. In retrospect, employee parking could have been provided at close-in locations at the twenty dollar fee with confidence that it would have dwindled to a small number in time to handle projected peak visitor parking levels.

VIP Parking

Almost without exception, there was always a surplus of parking space available for VIPs (see Table 5-3). The only difficulty encountered was in enforcing the operating regulations in VIP lots. Among these were occupying two stalls with one car, not displaying permits, parking in incorrect VIP lots, and blocking other cars in their spaces. During the first few weeks of operation, several VIP vehicles parked in unauthorized locations were towed. This caused a major confrontation between Fair management and operating staff. Ultimately towing of any VIP vehicles, regardless of location or permit status was halted.

TABLE 5-2

EMPLOYEE PARKING

	Anticipated Need		May		July		Fall	
	Permits	Spaces	Permits	Spaces	Permits	Spaces	Permits	Spaces
Walk-In	200 700[2]	250[1]	200	180	230	220	210	450
Remote	600	850	370	550	150[1]	550	0	0
TOTAL	800	1,800	570	680	380	720	210	450

[1]KIEE - operated

[2]Private sector or on-street

TABLE 5-3

V.I.P. PARKING FACILITIES

V.I.P. CATEGORY	TOTAL PERMITS ISSUED	SPACES IN OPERATION ANTICIPATED NEED	MAY	MID-SUMMER
Gold Passport	525	150	135	
International Exhibitor	65	52		
Other(1)	290	275	360(2)	360(3)
TOTAL	880	475		360

NOTES:

(1) Corporate participants 180
Press (permanent) 60
Board of Directors 50
290

(2) Portions of one lot shared with close-in employee parking. Estimated 430 spaces available for VIPs.

(3) One VIP lot converted to employee parking, one shared by employees and VIPs. Estimated 300 spaces available for VIPs.

As time went on, VIP parking decreased in the same manner as employee parking. The approach taken at the 1982 World's Fair was appropriate in that it offered the flexibility to reduce VIP spaces as demand reduced. These spaces were later utilized by employees.

Security

Parking lot security was provided by the KIEE Security Division at night. Security forces also acted as parking attendants at night in VIP and employee lots. This enabled KIEE to reduce personnel costs in parking facilities.

KIEE went through a series of cost cutting campaigns during the six months of the Fair. By the end of summer most security forces had been withdrawn from parking lots. Only occasionally did KIEE security forces check KIEE-operated lots for safety and security purposes. By October all security forces had been withdrawn from parking lot duty due to budget constraints.

There were few security problems during the six months of operation. The presence of security officers obviously had a deterring effect. There were several robberies of attendants at remote lots. On a few occasions, vandals or troublemakers were detained and turned over to the Knoxville Police Department.

FINANCIAL RESULTS

Most parking operators lost money during the Fair. Those in business to provide visitor parking had lower occupancies than expected due to the excessive supply. Long-time downtown parking operators raised their fees and then found that most lots suffered from lower utilization, which caused reductions in revenues for some.

KIEE lost money not only on visitor parking, but also by providing excessive parking for VIPs and employees. Some of these spaces could have been utilized for visitor parking since they were located close to Fair gates.

CONCLUSIONS

The single most important decision made relative to parking was KIEE's decision to break even financially on transportation. This decision, combined with the resulting $6.00 parking fee and the City's determination to limit its control of temporary parking facilities to meeting

standards and zoning regulations, generated a surplus of World's Fair parking space. This surplus had far-reaching consequences in the financial problems it created for KIEE as well as private parking lot operators.

Positive Aspects

On the positive side, the mode split estimates turned out to be quite accurate. Vehicle occupancy estimates were typically 3.5 to 3.8. However, the estimates of total parking demand were slightly low. Operationally, the available space was generally well located, and more than adequate to meet peak demands. Access to parking facilities worked well due to prior roadway improvements, an effective trailblazer signing system, and location of parking on Fair approach routes to intercept vehicles before they reached the site. Also the downtown parking supply was increased due to several permanent lots created in the process.

Clearance of some poor to marginal areas occurred in an effort to provide potential parking. Several cluttered vacant lots were cleared and graveled.

The KIEE approach of involving the private sector was sound. It reduced KIEE's budgetary (expenditure) commitment which, under its financing package, was desirable. It also reduced early negative cash flow which is critical to a World's Fair.

Negative Aspects

KIEE's impatience to tie down the official parking system coupled with the late creation of many lots resulted in both KIEE and other private sector interests suffering financial losses due to an oversupply of spaces.

KIEE should have more carefully analyzed the impacts of price elasticity on parking supply. In setting the daily parking fee, this knowledge may have affected not only the fee, but perhaps the entire approach to KIEE participation in parking.

The failure to realize that many of the 90th percentile days would occur during weekends rather than on "school" weekdays resulted in an overestimate of parking needs. Estimates for VIP and employee parking also proved too high.

The overall parking system relied heavily on creation of new facilities. Most of these were temporary and required a rapid recovery of investment through relatively high parking rates. The financial base for the parking system might have been improved if more facilities had been usable for parking after the Fair.

As with Fairs in Seattle, San Antonio, and Spokane, remote lots again proved unattractive to visitors and employees. It is possible that the 1982 World's Fair could have survived with virtually no lots beyond a 1/2 mile distance from its gates, since approximately 8,000 off-street visitor spaces were available on "school weekdays" within this distance.

The relationship between parking supply and demand could have been better balanced if information on the number of permitted lots were disclosed earlier. This was complicated, however, by the unwillingness of entrepreneurs to make firm commitments and the desire of the Transportation Services Division to keep negotiations private.

The trailblazer signing system was very effective. However, motorists tended to use the first freeway exit signed for Fair parking, even when signing indicated that subsequent exits also offered parking. Therefore, the distribution of parking lot usage was heavily skewed toward the first exit along each approach to the Fair.

The location of many parking facilities along the Dale Avenue approach to the north bus terminal created a conflict between tour buses and inbound autos during the peak inbound tour bus period. It would have been desirable to separate the tour bus and automobile access routes to the north gate area if possible.

Visitor parking prices drove up downtown parking rates. Many monthly parkers were driven from their preferred parking locations to other less desirable locations or were encouraged to change modes of access to downtown. By the end of the Fair many downtown parking operators were begging for the monthly parkers to return. The slow return of monthly parkers encouraged a decline in rates approaching pre-Fair levels.

It is possible that earlier negotiations might have reduced the cost of providing the parking system. However, given the relative portion of parking costs attributable to land costs, it is unlikely that rates would have been much below the $6.00 fee.

CHAPTER 6

TOUR BUSES

To accommodate the relatively large volume of tour and charter buses expected to arrive at the World's Fair, expected to be up to 500 buses on a peak day, KIEE developed a system consisting of several elements. They are:

1. An off-street terminal capable of handling as many buses as possible within the constraints of the available land. Due to the different nature of their operations and the desire to spread out arrivals among the four Fair gates, tour buses and shuttle buses were to operate out of separate terminals.

2. An advance reservation system to ensure that buses would be able to pick up passengers in the terminal facilities at their desired time.

3. A method to enable departing passengers to locate and identify their bus quickly at busy times in the terminal.

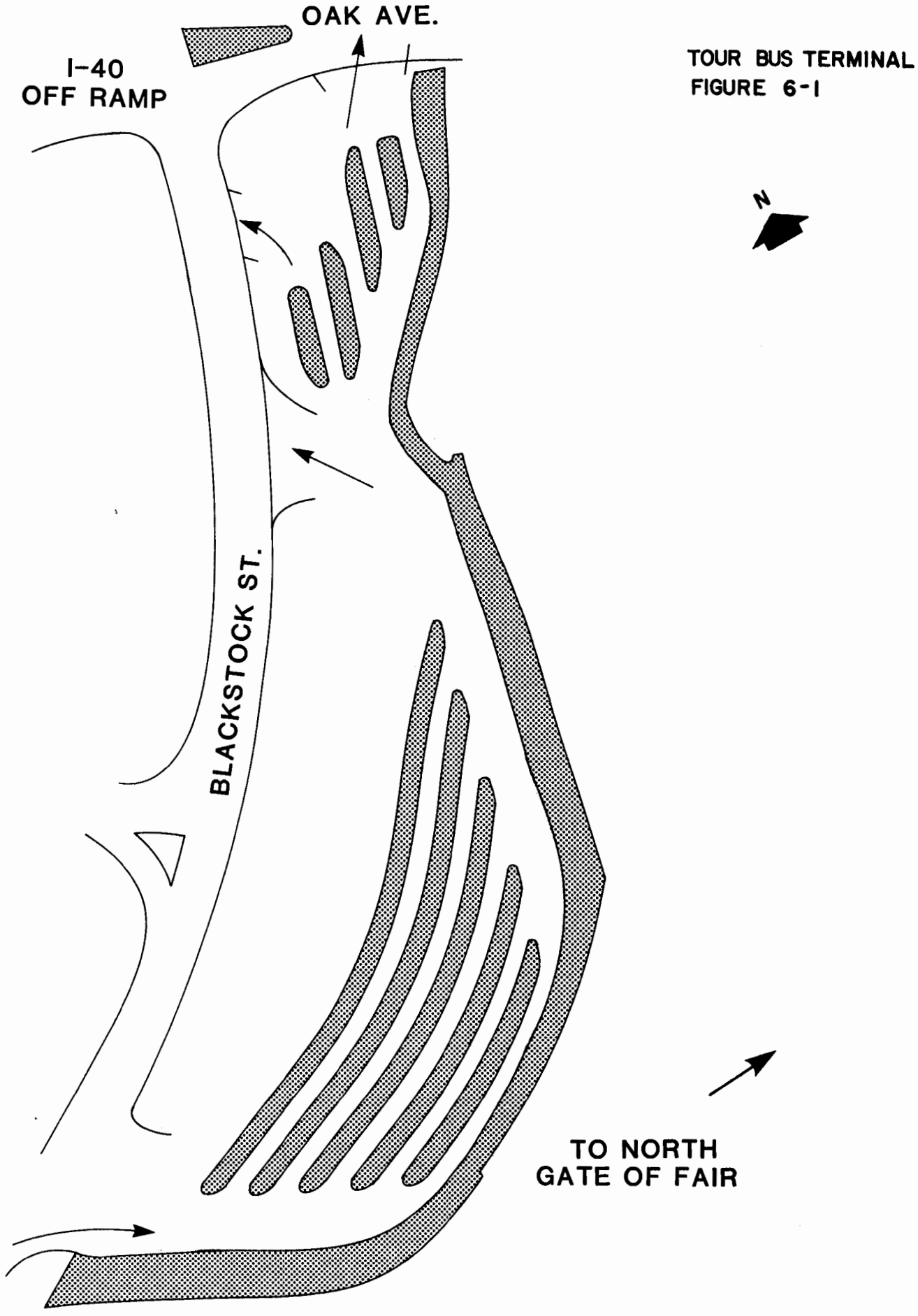
4. Crowd control devices to increase passenger safety and maintain separation between pedestrians and vehicles.

5. Remote facilities for charter and tour bus parking and servicing.

OVERVIEW OF TERMINAL DESIGN AND OPERATION

Layout

Many of the design and operational features of the charter and tour bus terminal were dictated by the location and configuration of the land. Since a limited amount was available, the terminal was laid out to maximize the number of buses that could be loaded or unloaded at a given time, which was 54 buses. To accomplish this, buses could not be allowed to arrive and depart at random. The most efficient terminal layout required a series of parallel passenger platforms and in-line bus lanes (see Figure 6-1). A number of buses would pull into the bus lane adjacent to a platform at one time, unload or load simultaneously, and depart the terminal at approximately the same time. With one exception, there was no passing lane associated with any bus platform. Once a bus had been assigned to a platform, it had to move in sequence with the other buses assigned to that platform.



TOUR BUS TERMINAL
FIGURE 6-1

Greyhound, as the Official Motor Coach Carrier of The 1982 World's Fair, was allocated exclusive platform space for 15 buses and authorized to handle their own dispatching. Trailways, after proving that their anticipated volume justified assignment of a platform for their exclusive use, was assigned a platform accommodating eight vehicles and authorized to self-dispatch. All other charter and tour bus carriers arriving at the Fair were under direction of KIEE Transportation Services staff while in the terminal area.

Arrivals and Departures

As a natural corollary of the layout, it was necessary to schedule departures from the terminal at fixed times so passengers could meet their buses. Originally, all departures were scheduled for the hour and half-hour. Morning arrivals were not scheduled because it was felt they were much more difficult to control and did not require meeting passengers in the terminal.

Reservations

Scheduled departures necessitated a system of advance reservations for departure slots. This way visitors arriving at the Fair in the morning could be sure that their bus would be available at a designated platform at a specific time. They would also be aware that the bus would have to leave the terminal at a specified time in order to make way for the next group of buses.

KIEE employees met the arriving buses in the morning, verified those with advance reservations and made departure reservations for the rest, and assigned each bus a departure platform and time. A windshield card bearing a unique number was issued to each bus and the driver or tour escort was issued a pad of reboarding checks bearing the same number to distribute to the passengers. The reboarding check number served to identify the bus. This facilitated locating buses for passengers who could not remember the platform assignment and enabled KIEE staff in the terminal to keep track of which buses were authorized to be in the terminal and at what time.

Departure slot reservation requests were accepted by mail or telephone and confirmation sent to the carriers. The availability of the reservation system was widely publicized through a familiarization tour held for tour and charter operators five weeks before the Fair opened, through a bulk mailing distributed by the American Bus Association in cooperation with KIEE, and through individual mailings to charter and tour bus companies which had purchased group tickets from the Fair's Tour and Travel Division. The Tennessee Education Association was also contacted in an effort to encourage school groups to use the advance reservation system.

Tour Bus Parking

KIEE felt a responsibility to ensure that adequate parking for charter and tour buses would be available at other locations since a deliberate decision had been made not to accommodate bus parking close to the Fair. Accordingly, KIEE negotiated a contract with a local bus operator to provide parking for at least 250 charter and tour buses, with the ability to park additional buses if demand developed.[1] The lot operator also agreed to provide fueling, a vehicle sanitary dump, washing facilities, minor mechanical repairs, a drivers' lounge, and a shuttle service to the Fair for drivers who wished to tour the site. KIEE designated the facility as the Official World's Fair bus parking facility and publicized its availability and location in mailings to charter and tour companies.

ORGANIZATIONS INVOLVED IN PROVIDING FACILITIES

KIEE

KIEE planned, financed, and operated the charter and tour bus terminal. Greyhound and Trailways were helpful in providing advice on request. They also furnished buses to test the actual facility prior to opening day. The American Bus Association and the National Tour Brokers Association provided information on the numbers of charter buses anticipated to arrive at the Fair and maintained an interest in ensuring that the facilities would be adequate to accommodate their needs.

Regulating Agencies

After advising KIEE of their intent, the Tennessee Public Service Commission, the Interstate Commerce Commission, and the U. S. Bureau of Motor Carrier Safety conducted occasional safety and authority inspections of charter and tour buses arriving at the terminal. KIEE agreed to give these agencies free access to reservation files if they wished to know in advance whether a particular carrier had buses scheduled to arrive at the Fair on a given day. Terminal supervisors

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[1]This operator was selected from among four groups which proposed to operate an "official" tour bus parking facility. KIEE set criteria, standards, services and charges to be provided and accepted proposals responding to these requirements. The selection was made by KIEE's Management Committee based on a recommendation by its Transportation Services Division.

and commission inspectors agreed that inspectors would operate in the terminal during slack periods, but were not to interfere with the free movement of buses into and out of the terminal area. In practice, the inspectors occasionally came into the operating area of the terminal, but were extremely cooperative about moving into unused areas when asked.

Police

City and state police worked out arrangements with KIEE for operating the terminal and adjoining portions of Blackstock Avenue to minimize traffic congestion. The City required KIEE to post a uniformed officer on duty at the entrance to the bus terminal during busy hours to assist in maintaining separation between pedestrians and vehicles, preventing unauthorized vehicles from entering the bus terminal, and generally keeping traffic flowing smoothly. Because of the location of the terminal adjacent to the north gate of the Fair, automobile traffic tended to stop at the entrance to the bus terminal on Blackstock Avenue to pick-up and drop-off passengers (see Figure 6-2). At busy hours this seriously interfered with traffic flow and vigorous enforcement measures were occasionally necessary.

The State was involved in traffic control during the first few days of the Fair, assigning several state troopers to assist in traffic control on Blackstock Avenue. The rationale was to facilitate the free flow of traffic on city streets to eliminate back-ups on expressway ramps, which were within the normal state police jurisdiction.

OPERATIONS

Due to the aggressive tour marketing campaign, an average of about 310 tour buses arrived at the Fair each day. High days ranged over 700 buses in May, with volumes dropping off during the summer and picking up in the fall.

During the first several weeks, nearly all buses arrived at about 10 a.m. to give tour members a full day at the Fair. This caused long queues to develop on the busy days since not all buses could be accommodated at once. Approximately 250 inbound buses and 180 outbound buses were handled in respective peak hours.

Ultimately tour operators realized they could avoid delays by scheduling arrivals later in the morning. This became more appealing to the operators when they realized that the 12 hours from 10 a.m. to 10 p.m. when the exhibits were open were too long for tour members to walk around in the Fair.

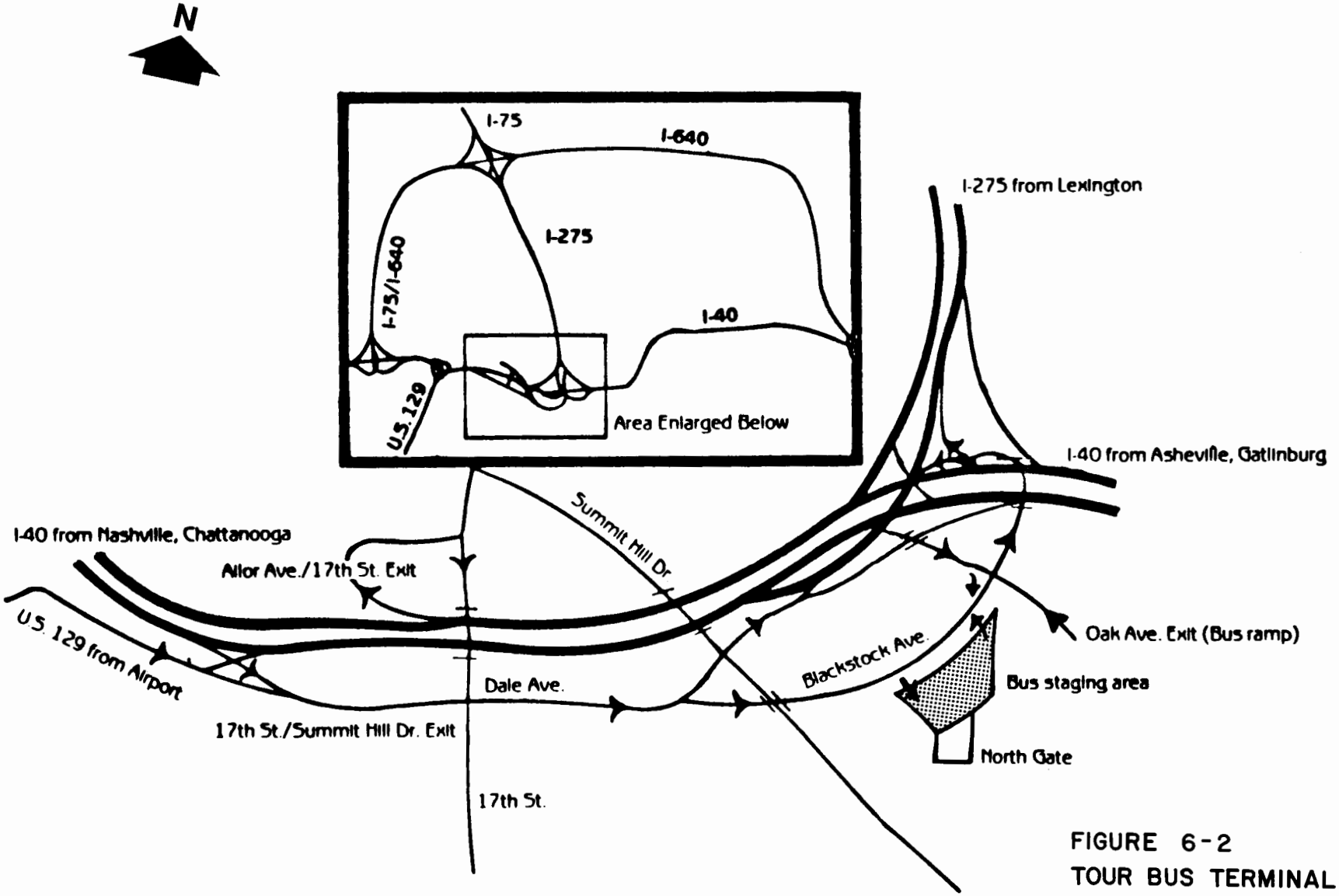

FIGURE 6-2
TOUR BUS TERMINAL ACCESS

The 12 hour stay developed due both to a housing reservation problem and to the success of KIEE's tour sales. Tour operators, impressed by the business potential offered by the Fair, became aggressive and booked lodging space for many trips. This resulted in a large percentage of the rooms, especially lower priced rooms, in the greater Knoxville area being booked. Operators were not required to pay for the reserved rooms until 30 to 90 days before arrival. Only when the operators failed to pay were rooms released. Of the tours booked, 40 to 50 percent were actually made. Therefore, many groups and individuals were forced into very remote lodgings or more expensive ones. This caused tour operators to organize one-day tours which would not require lodgings. To sell these tours, 12-hour stays were offered. This resulted in the high number of 10 a.m. arrivals.

Overall, the terminal operating procedures worked well. Departures went smoothly enough to allow quarter-hour scheduling on busy days. It was almost always possible to schedule departures within 30 minutes of the desired time.

Bus Parking

Greyhound and Trailways acted on their own to find adequate parking spaces for their coaches coming to the Fair. The designated remote bus parking area, operated initially by a local carrier under contract to the Fair, was located some 4½ driving miles from the site. This distance was perceived as inconvenient by numerous bus drivers. One private entrepreneur created a bus parking lot within four blocks of the north Fair gate and offered fueling and toilet dump servicing on his premises. A portion of the official automobile parking lot near the north gate, which was underutilized throughout the course of the Fair, was quickly converted to bus parking.

The original operator of the remote parking facility found his facilities swamped during the opening weeks of the Fair. This operator decided that bus parking and servicing was incompatible with his main business of operating a bus line and entered into an agreement with a local heavy equipment operator with comparable facilities nearby. The remote operation was transferred there in late May. However, the availability of other parking space which was closer, combined with the drop-off in bus traffic that occurred beginning in July, caused the new remote location to fare poorly. By July, the "official" remote facility had all but ceased operation due to lack of demand.

Information System

Before the Fair opened, the planners felt that a number of communication devices might be necessary to advise passengers of departure delays arising from equipment breakdowns, traffic congestion between remote bus parking facilities and the Fair, or other unforeseen incidents. Plans were made to post a "delay" board at the exit from the north gate. Discussions were held concerning the availability of the Fair's closed circuit information channels for posting such information. Terminal staff were also supposed to determine, upon arrival, where each bus would be parked for the day. For various reasons, most of these plans were not implemented.

Experience proved such communications were unnecessary. Traffic congestion did not materialize; equipment reliability was excellent; and the occasional lost passenger or lost bus was handled on an ad hoc basis by staff from the dispatch booth in the terminal. The reboarding check system enabled the staff to quickly identify on which bus lost passengers belonged.

On an average day, up to six inquiries were received in the transportation office from passengers who had forgotten where their bus would pick them up. Delays in bus departures caused by missing passengers were minimal, ranging from none to 10 per night, with the larger numbers occurring on days when there were large numbers of school children visiting the Fair. An on-street "penalty box" area had been designated outside the terminal for buses that had to await missing passengers. This system worked quite well and on slow days the terminal operating staff took it upon themselves to allow buses to depart the terminal, but return immediately to the same platform. This minimized confusion and expedited departures.

Exclusive Bus Lanes

Although the bus-only ramp leading from I-40 to the north gate reverted to nonexclusive status shortly after the Fair opened, conflicts which occurred between automobiles attempting to turn into parking lots and buses wishing to enter the terminal suggest that separation of automobile and bus traffic, giving buses unrestricted access to the terminal area, is a desirable feature wherever it can conveniently be achieved.

CONCLUSIONS

Experience with the charter and tour bus terminal at the 1982 World's Fair permits several conclusions to be drawn. The Phase II report will provide greater detail relative to several conclusions.

Demand

Approximately 20 percent of Fair visitors utilized charter and tour bus transportation. The growth of the charter and tour bus industry in recent years, combined with active early promotion of charter and tour bus business by the World's Fair Tour and Travel Division, resulted in this surprisingly large mode split. The ability of the bus industry to attract large numbers of visitors to special events such as the World's Fair should not be underestimated in planning for the future.[2]

Concept

The concept of making use of buses as attractive as possible by allowing them to unload directly at a Fair gate to minimize walking helped make bus travel a popular mode for access to the World's Fair. Given the anticipated scarcity of parking space adjacent to the Fair, it also initially appeared to be the only viable option. However, a surplus of automobile parking spaces in the vicinity of the north gate, which developed the last 30 to 45 days before the Fair's opening, led to some speculation that it might have been possible to accommodate charter bus parking within walking distance of the Fair, although the walk would have been up to a half-mile in some cases. A more detailed analysis of this issue will be undertaken as part of Phase II.

Design

The terminal design, using long platforms and bus platooning, is an efficient use of space. However, moving buses and pedestrians quickly and safely through a pull-through terminal requires substantial staffing. KIEE used as many as 16 persons to handle the traffic in the morning rush period for the first few weeks of the Fair, which was the busiest tour bus period, until users had gotten experience with the terminal layout.

Training

Terminal operations, as noted above, were labor-intensive but effective. Lead dispatchers underwent a two-week training period before the Fair opened. The training program was viewed as essential to the success of the operation.

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[2]Nor should the cash flow value to the Fair. Nearly one million tickets were sold to tour operators well in advance of the Fair. The resulting cash helped KIEE pay much of its start-up costs.

Vehicle Access Control

Keeping unauthorized traffic out of the terminal proved to be a substantial problem, requiring a uniformed officer to be on duty during busy hours. Future events may find it possible to design terminal access roads to separate bus and automobile traffic to a greater degree and, thereby, reduce the necessity for this type of enforcement. However, it should be noted that taxi drivers are prone to attempt to pick-up or drop-off fares as close to a gate as possible and that vigorous enforcement of prohibitions on automobiles in a bus terminal is mandatory for safety.

Reservation System

The reservation system for departures also proved essential to ensuring an orderly flow of traffic in the terminal. It was costly and required the services of five clerical workers for the month before the Fair opened and at least a month thereafter as well as substantial postage costs to mail return confirmations to tour and charter operators. Nevertheless, in a situation where a terminal of this type must be used, some method of spreading peak loads and identifying departure times and platforms must be devised. The reservation system accomplished that. It also reduced check-in time which increased terminal capacity during the AM peak period to 250 arrivals per hour.

Furthermore, by leaving some space at each departure hour for unscheduled traffic and by allowing the terminal staff to use their ingenuity, it proved possible to increase the hourly capacity of the terminal well beyond the 100 bus departures originally envisioned. Approximately 180 departures per hour were accommodated on peak days.

Bus Parking

With hindsight, it appears the private sector was fully capable of providing the requisite amount of bus parking at remote locations without stimulus from the Fair. The amount of parking needed, about 20 to 25 percent of the total arriving tour buses, was less than had been expected. The designated remote parking facility was useful in reducing uncertainty for the smaller charter and tour bus operators who were unfamiliar with the area and would have had to exert substantially more effort to secure parking spaces for their buses in the absence of a facility designated by the Fair. Once drivers became familiar with the area, they selected parking locations based on convenience since it was apparent there was no shortage of bus parking facilities. Drivers on return visits to the Fair were more willing to dead-head the coaches back to the lodgings where the groups were staying. This further reduced the pressure on parking near the site.

Reducing Delays

The reservation system ensured that departure delays were minimized. Unfortunately, there appeared to be no satisfactory method of eliminating arrival delays. An arrival reservations system did not appear practical for several reasons. First, too many variables outside the control of the coach operator influenced arrival time, such as length of trip from origins, traffic conditions, passenger boarding delays, service delays at restaurants en route, etc. Therefore, the range of uncertainty surrounding an arrival time request is much greater than that surrounding a departure request. Second, attempting to prevent buses from entering the terminal to unload passengers once they had arrived at the terminal would have created illwill for the Fair as well as potentially serious traffic congestion and confrontations with frustrated drivers and passengers. Third, the amount of clerical work necessary to manage an arrival reservation system would have added substantially to that already required for the departure reservation system. Fourth, some accommodation would have been necessary for those operators who were unaware of the advance reservation requirements and simply arrived at the Fair.

Terminal Amenities

Lack of adequate shade and seating facilities in the terminal resulted in a number of cases of heat prostration during the early days of the Fair. Benches were ultimately procured, but no satisfactory solution was ever found for the lack of shade. In extreme cases, visitors who became ill were allowed into the air conditioned dispatch booth. Unfortunately, this often had the effect of disrupting operations since several carriers were sharing a 150 square foot space with KIEE terminal staff.

Processing Time

In the early days of the Fair, the transaction time required for a KIEE dispatcher to board the bus, ascertain the departure time, issue the windshield card and reboarding checks, and explain procedures to the drivers typically ranged from 1.5 to 2.0 minutes. As drivers and dispatchers alike gained experience, this time dropped substantially. By the end of the Fair, it was possible to conclude processing within 30 seconds due to familiarity of both terminal staff and drivers with the procedures.[2] This enabled the Fair to reduce the levels of terminal

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[2]Most drivers drove numerous tour groups to the Fair.

staffing to a minimum consistent with safety and a reasonable level of service. Drivers and passengers alike were quite cooperative in waiting on board the buses until processing had been completed. This was essential in order to ensure the passengers would know where and when to find their bus for the return trip.

CHAPTER 7

SHUTTLE BUSES

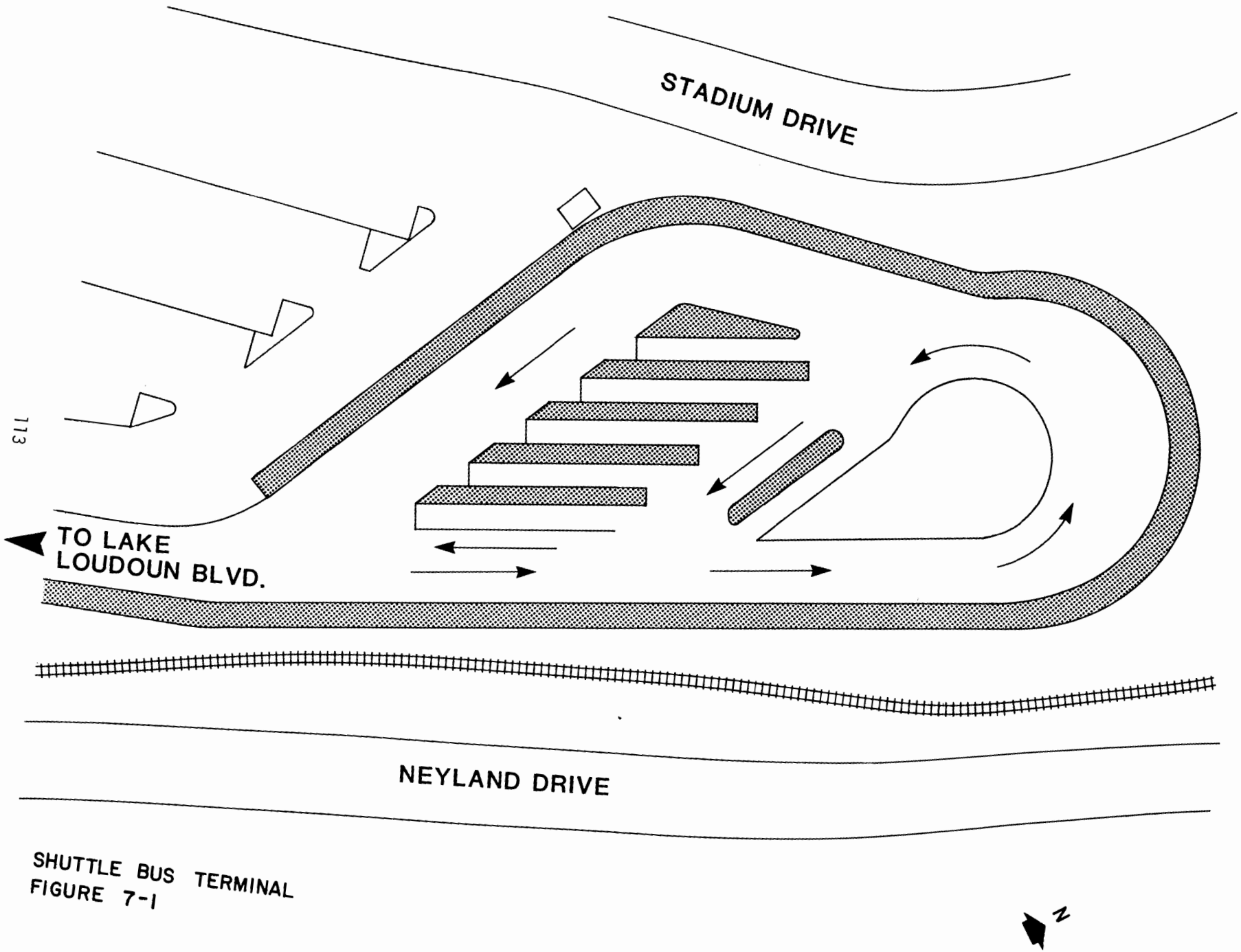
Shuttle buses were provided with a terminal at the Fair's southwest gate as part of the concept of separating traffic arriving at the Fair by type and distributing arrivals among the four gates. For operational purposes, shuttle buses were defined as those vehicles serving hotels, motels, outlying communities, and parking lots that were not part of the Official World's Fair parking system. Shuttles from the Official World's Fair parking lots were routed to the terminal on Locust Street near the Fair's east gate. A shuttle bus did not necessarily depart the Fair with the identical load of passengers it had brought to the Fair and shuttle buses went back and forth each day picking up whoever was ready to go on each trip.

TERMINAL DESIGN CONCEPT AND CONSTRAINTS

In most cases, shuttle buses operated on set schedules. Therefore, the appropriate design concept for maximum utilization of the available space involved assigning each carrier to an unloading space that could accommodate the proposed amount of service. In some cases, this meant a single bus berth was shared by several different carriers. In other cases, a single carrier had an unloading space that could accommodate several buses simultaneously.

The terminal was a long, narrow strip permitting unloading along one side with a loop area at the end which accommodated several buses (see Figure 7-1). The major constraint on terminal design was the limited space available. In essence, the terminal was created by adding fill to the edge of an existing University of Tennessee parking lot. The University's agreement with KIEE required that there would be at least as many parking spaces available for students during the academic year as there had been prior to construction. This meant that only the area which could be created by expanding the existing lot was available for the bus terminal. Because of the topography of the site, the distance from the entrance of the bus terminal to the beginning of the walkway of the Fair's southwest gate was almost 1,000 feet.

The terminal could accommodate up to 34 buses and 10 vans simultaneously. Over 70 carriers applied for rights to provide shuttle bus service to the Fair. Virtually all of them were to be routed to the southwest terminal. Trailways proposed to operate buses every three minutes from Gatlinburg to the Fair, which meant that a minimum of four bus berths was required for that service alone. Other carriers had similar grand plans before the Fair opened for the amount of service they would operate.



SHUTTLE BUS TERMINAL
FIGURE 7-1

When KIEE's transportation planners aggregated the total amount of proposed service and the total number of passengers that could be accommodated, assuming a relatively low load factor, it was apparent that the total level of proposed shuttle bus service was far in excess of potential demand, which was originally estimated to be 10 to 15 percent of attendance. The planners were satisfied that the terminal had adequate capacity to accommodate the number of passengers that would be using it, but the number of buses to be accommodated was another matter. This was perhaps the most difficult shuttle bus problem which confronted KIEE before the Fair opened.

AGENCIES INVOLVED

In addition to KIEE, the University of Tennessee was involved in the shuttle bus terminal. As the land owner, they effectively constrained what could be done in creating the terminal area. Because of the relatively short distance between the entrance drive to the bus terminal and the intersection of Lake Loudoun Boulevard and Neyland Drive, the City was actively interested in traffic control at the bus terminal as well as at the parking lot exit near the terminal.

The carriers requesting permission to use the terminal all negotiated independently with KIEE for their terminal space, although there was a brief attempt by the University of Tennessee's Transportation Center act as a broker. Finally, and perhaps most importantly, the Tennessee Public Service Commission and the City of Knoxville played a major role through their actions, even though direct contact between both agencies and KIEE was primarily in terms of sharing of information plus testimony by KIEE at the hearings held for carriers applying for operating authority to serve the Fair.

The Public Service Commission and City of Knoxville Regulatory Activity

The number of carriers applying to provide shuttle service to the World's Fair was far in excess of the number that were economically viable, given the size of the market. The Public Service Commission (PSC) scheduled hearings for January 19th and 20th for the first group of carriers, but was forced to postpone them when an ice storm made it impossible for commissioners to get to Knoxville for the hearings. Because of the requirement for 30 days legal notice prior to holding a hearing, a full month's delay ensued before the first round of hearings could be held. This meant that no carrier applying for new rights was heard before late February.

The PSC then deliberated for some time before ruling on applications and the first group of applicants were not notified officially until late March that their applications had been approved. This, in turn, meant that a number of them had either taken substantial risks in contracting for equipment purchases, driver services, etc., without knowing if they would get the rights, or found themselves scrambling at the last minute to put an organization together. Most of the carriers had not operated service in the Knoxville area prior to the Fair

Neither the PSC nor KIEE had a clear view of the size of the market to be served. As a result, the PSC decided not to attempt any form of economic regulation of the carriers other than setting fares which it thought were reasonable. These were based on mileage, as shown in Table 7-1.

The City of Knoxville Division of Public Transportation Services went through a similar process of certifying shuttle operators for service totally within a seven mile limit of the city boundaries. The City certified approximately 175 shuttle buses for shuttle service up to the day before the opening of the Fair.

For all practical purposes, every carrier that filed a completed application to serve the Fair and provided the necessary evidence of insurance coverage and financial responsibility was awarded rights. Thus, the PSC chose to let the market place determine who would succeed and fail, presumably realizing that there would be some failures, but not wishing to bear the responsibility for denying willing entrants an opportunity to test themselves in the market place. Both agencies attempted to enforce their requirements, but neither had adequate manpower.

Implications of the PSC Actions

KIEE realized one result of the PSC's actions would be a demand for more space in the shuttle bus terminal than was justified by the economic realities of the situation. However, KIEE felt that it also had to be impartial and provide access opportunity to the gate for all entrants in the shuttle bus market.

This created substantial difficulties in planning the use of terminal space. A number of the carriers felt very strongly that their success would be based on the ability to provide frequent service and insisted they needed a large space in the terminal to load several vehicles at once. They further claimed that denying them the amount of space they demanded would doom them to failure. The KIEE, as noted above, was

TABLE 7-1

MAXIMUM ONE-WAY SHUTTLE BUS FARES[1,2]

ONE-WAY MILEAGE	ONE-WAY FARE		
	VAN	COACH WITH AC, RESTROOM	SCHOOL BUS AND OTHERS
1-10	$ 2.00	$ 3.00	$ 2.50
11-20	2.75	3.50	3.00
21-30	3.25	4.00	3.50
31-40	3.75	4.50	4.00
41-60	4.25	5.00	4.50
61-80	7.25	8.00	7.50
81-120	9.25	10.00	9.50
121-150	10.25	11.00	10.50
151-170	12.75	14.00	13.00
171-190	14.75	16.00	15.00

[1]Set by Tennessee Public Service Commission

[2]Charter fares were $1.50 per line mile for 39 passenger buses, $1.60 per line mile for 46 passenger buses, and $1.00 per "deadhead" mile.

aware that projected passenger demand could not justify the amount of vehicle space requested, but could not predict which carriers would be successful given the amount of information available between the PSC's decision and the Fair's opening.

The staff's response was to request all the carriers who wished to operate from the southwest terminal to submit their planned operating schedules, points served, and an explanation of the nature of the contracts they held (if any) with various campgrounds, motels, etc. KIEE Transportation Services staff reviewed the requests, made an initial allocation of space, and discussed the situation candidly with the carriers. Most were relatively cooperative, particularly when staff assured them that a space reallocation would be made a month after the Fair opened. The Fair's staff, in turn, was quite certain that by the end of May there would be no difficulty matching demand to the available supply.

COORDINATION OF SERVICE

With so many shuttle operators interested in providing shuttle service, there was a rush to market services to operators of lodgings and remote parking lots. The first operator seriously marketing services approached KIEE in the Fall of 1981 to sanction that service as the "official" shuttle service of the Fair. However, that operator and all others declined to meet the criteria for official designation.

At that time, KIEE decided it would not play an active coordinating role. This decision was based primarily on the lack of time available to assist both shuttle operators and lodging management in reaching satisfactory service agreements and to help them create viable operations. KIEE attempted to form "service areas" by referring shuttle operators to hotel/motel associations for assistance in grouping lodgings. Instead, each shuttle operator contracted with whatever lodging or parking operator would make a deal. Thus, most operators served scattered locations which resulted in duplication of service and unprofitable operations.

Probably the only way this service could have been profitable was if service duplication could have been reduced to minimal levels. This would have required (1) fewer operators, perhaps through more rigorous PSC requirements, (2) close coordination of service to lodgings within each area or corridor, and (3) a better understanding of the economics of the shuttle bus business by prospective operators. However, given the "speculative fever" created by the Fair, the above would have been difficult to achieve.

As in the charter and tour bus terminal, KIEE staff's only recourse once a taxi had entered the terminal was to order it out immediately and to inform the company of repeated and persistent violations. KIEE employed a sheriff's deputy who was stationed at the lot entrance during busy hours. However, it was not always possible for him/her to distinguish between a van belonging to a shuttle service that was legitimately entitled to be in the lot and one belonging to a taxicab company that was not. Furthermore, attempting to stop the vehicles at the entrance to the lot during busy hours would have created worse traffic congestion.

Access Difficulties

The shuttle bus terminal was located at a major access point to the University of Tennessee prone to traffic congestion. On leaving the terminal, all buses turned left across a four-lane street and proceeded south about 150 feet to a T-intersection. Between the terminal entrance and the T-intersection were parking lot entrances on each side of the street. About 125 feet north of the terminal entrance was an official World's Fair parking lot entrance and a University parking area was across the street.

During the morning peak period, auto traffic attempting to enter the parking lots queued up and blocked the terminal entrance, conflicting with bus movements. Autos often attempted to enter the bus drive to park, which caused further conflict.

During the evening, the officer stationed at the terminal entrance had to stop traffic on Lake Loudoun Boulevard for all buses to leave the terminal. This movement had to be coordinated with manual operation by a city officer of the traffic signal at Lake Loudoun Boulevard and Neyland Drive because distance between the entrance and the intersection was insufficient for the amount of storage required.

Communication Between Carriers and KIEE

Each applicant for PSC authority was informed about the configuration of the shuttle bus terminal by letter from KIEE. Similar letters were sent to those operators who applied for authority to serve totally within the City's jurisdiction. They were advised that KIEE would allocate terminal space based on their proposed operating schedule and anticipated demand, subject to the constraint that all carriers had to be accommodated within the terminal.

Several major carriers (Trailways, Energy Express, K-TRANS, Southern Cartage) had sought out KIEE Transportation Services staff months before the Fair opened to discuss their plans and needs. KIEE staff discussed space needs and assignments in person or by telephone with each carrier

who used the terminal. The final space allocations were made just prior to opening and carriers were informed about their assignment. A familiarization day was held on the Sunday before the Fair opened. KIEE terminal staff were on hand, as part of their training program, to direct participating carriers' buses and vans through the terminal in a simulation of actual operations. Although the weather was very rainy, many carriers participated and brought as many of their drivers as possible to familiarize themselves with the terminal layout. Most carriers queried felt that the exercise was very helpful in minimizing opening day confusion.

SHUTTLE BUSES SERVING KIEE REMOTE PARKING LOTS

KIEE contracted for shuttle bus service between remote "official" visitor lots plus one employee lot and the Fair. KIEE initially negotiated with K-TRANS to provide service to all remote operators in the Fall of 1981. However, KIEE sought out another operator because of a failure to reach mutually acceptable contract terms involving cost and performance standards. In the end, KIEE decided to contract Transportation Enterprises, Inc. for half the needed service and K-TRANS for the other half. This was done because (1) it was felt that neither operator could satisfactorily meet projected peak fleet needs (which turned out to be over-estimated) and (2) KIEE was concerned about the ability of K-TRANS to respond to such a great service increase (about 1/3 at peak times). In essence, KIEE did not want to depend on one operator for all shuttle service.

The contracts were negotiated on an hourly fee basis with certain related provisions. K-TRANS had been offered a fee-per-ride contract, but rejected it as being too risky. Transportation Enterprises, Inc. (TEI) was selected as the other operator primarily because its specialty is shuttle bus service and it could provide buses with front and rear doors to expedite loading and unloading.

CONCLUSIONS

Quantity of Service

The approach taken to grant operating authority for shuttle service was to approve all complete applications meeting minimal requirements. It was evident there were going to be financial failures with over 70 operators competing for what amounted to only five percent of the daily attendance (average 3,000 riders daily). Many ceased service by mid-summer and only a dozen or so still operated regularly during the last month of the Fair. Had applications been due and processed by December and those approved been publicized, all prospective operators could have more accurately assessed their potential.

The cessation of service by many operators left some pre-paid ride ticket holders with useless transportation tickets which created bad publicity for the Fair. Fairgoers had no realistic recourse. If there had been fewer operators, shuttle service would have been more profitable and these failures would have been less frequent. However, the politics of stronger regulation would have been difficult in Knoxville due to the attitude that each applicant should have an opportunity to seek a share of the potential profits related to the Fair.

In summary, at first there was too much service; ultimately there may have been too little. A free-market condition without coordination of services, combined with extensive interest in operating shuttle service, was the cause of this condition. The primary objective should be to ensure continuity of service once it is initiated.

Separate Terminal

The initial volumes of buses and the different natures of the two types of operation made separating tour and shuttle buses necessary. They would not have worked well together initially. However, as volumes of both types decreased and shuttle service was on less frequent headways, shuttle bus operations began to more closely resemble that of tour buses. During the last month of the Fair, both operations were combined in the tour bus terminal, although they were operated from separate areas within the terminal.

Fares

Fares were high enough that a family of two could drive and pay $6.00 to park for less than they could ride a shuttle. Shuttles could only be considered appealing to (1) Fairgoers without other transportation, (2) Fairgoers with prepaid shuttle tickets, and (3) those wanting to avoid traffic congestion they expected to encounter along the way. Most shuttle riders who had the choice drove after their first visit.

Signing and Stop Locations

Riders could easily locate their buses or vans by relatively small (24" x 30") signs posted next to the appropriate berths. Many asked for help in finding the correct berth, especially for those shuttles located farthest from the gate. A map near the gate would have helped as would reboarding checks, issued by operators, of the type used in the tour bus terminal. Specific loading locations were necessary in a terminal situation so vehicles could go to where riders awaited them, load quickly, and leave.

Access Points

Bus terminal access should not be located in congested areas. Bus movements in and out become difficult and congest the terminal or require police control to create gaps in traffic.

Communications Between Carriers and KIEE

Due to the nature of this type of service and the number of operators, good communication with KIEE was essential to operating efficiency. Operators were able to work with KIEE and each other to facilitate vehicle movement and send passengers to the right place at the right time. Without this cooperation, all 70 operators could not have been accommodated in 44 berths, nor could service have been adjusted to meet changes in demand and losses of operators. Some operators assumed service dropped by others.

Shuttle Bus Service To KIEE Remote Lots

KIEE contracted with two operators to provide up to 30 buses for remote parking lot shuttle service. After opening weekend, this large number of buses was never needed. As time went on, the number of buses in operation decreased. Ultimately TEI ceased service as KIEE cancelled contracts to provide that service. At that time, service was down to a peak of five TEI buses, which is too low for a viable operation of that type for an out-of-town operator. However, K-TRANS picked up the service under direct contracts with lot operators.

This service could have been provided by one operator. The differing philosophies of KIEE and K-TRANS made negotiations difficult. While KIEE was attempting to follow their break-even policy, K-TRANS wanted assurance it would not lose money and hoped to make some profit to cover their overall operating deficit. K-TRANS would probably have been contracted for all of this service if the goals of KIEE and K-TRANS had been more similar.

CHAPTER 8

LOCAL BUS SERVICE

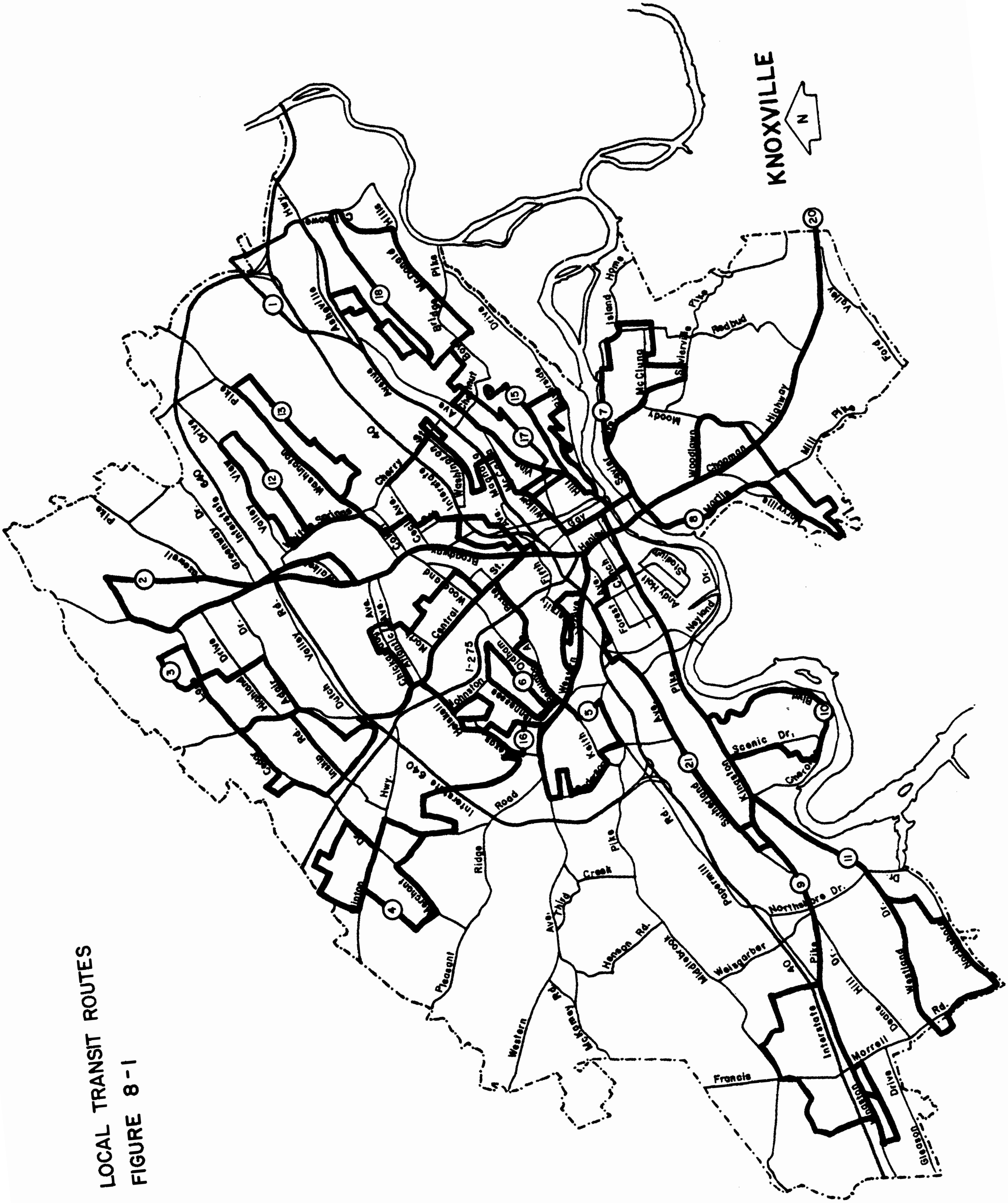
Transit service for the Knoxville urban area is provided by K-TRANS, a publicly owned system. K-TRANS provides fixed-route regular bus service, express bus service, school service, contract service to the University of Tennessee, and charter bus service. K-TRANS also provides special accessible service (through the LIFT Program) to elderly and handicapped residents of Knoxville.

The K-TRANS organization is part of Knoxville City Government. The policy-making board, the Knoxville Transportation Authority (KTA), has five commissioners reporting to the Mayor. K-TRANS is operated under the Division of Public Transportation Services, which also includes an administrative branch that is responsible for preparing grants, budgets, and reports along with administering the city taxi ordinance. Day-to-day operations of K-TRANS are administered under the direction of the Resident Manager. The Resident Manager is actually an employee of American Transit Corporation (ATC), which operates K-TRANS under contract to the City of Knoxville.

SERVICE CHARACTERISTICS

K-TRANS operates fixed-route bus service on 10 routes (25 route segments) radiating from Knoxville's Central Business District (CBD). These routes primarily serve areas within the City of Knoxville, with limited service to areas outside the city limits. This service covers 59 percent of the land area in the city, 76 percent of the city's population, and 69 percent of the city's employment, based on a one-half mile wide service corridor (one-fourth mile walking distance). These routes are shown on Figure 8-1. In addition, 14 express routes provide direct service from western and northern suburbs to Tennessee Valley Authority (TVA) and downtown Knoxville. Service is generally from 5:30 a.m. to 7:30 p.m., Monday through Friday, from 6:30 a.m. to 6:30 p.m. on Saturday, and from 8:30 a.m. to 4:30 p.m. on Sunday. Weekday headways vary from hourly during the off-peak to fifteen minute service in the peak. Weekend service consist of hourly headway service.

Ridership on K-TRANS has declined slightly since 1976. There was a sharp decline from 1976 to 1977, largely as a result of a six week transit strike. A gradual increase in ridership since that time has raised annual ridership above the three million mark. In calendar year 1981, K-TRANS averaged 256,300 passengers per month, including 232,900 on regular route service and 23,400 on express routes. Ridership on the express routes exhibited little seasonal variation,



LOCAL TRANSIT ROUTES
FIGURE 8-1

with the regular routes showing a seasonal pattern. Regular route ridership tends to be highest in the spring and fall, with dips in summer and winter. Some of the fluctuations in ridership were due to an increase in fares on March 30, 1981, from 50¢ to 60¢ base adult fare, and on October 1, 1981, from 90¢ to $1.30 for express fares.

Like many transit systems, K-TRANS has shown a pattern of expenses increasing more rapidly than revenues. Between 1976 and 1981, expenses increased by 51 percent, from $2,748,000 to $4,159,000, while revenues only increased 41 percent, from $1,336,000 to $1,891,000. Consequently, the annual operating deficit increased from $1,412,000 to $2,247,000.

In August, 1981, faced with the possibility of running out of operating assistance, the Knoxville Transit Authority (KTA) authorized K-TRANS to reduce service levels. KTA made a decision that any additional service for the World's Fair would only be provided if no additional fiscal burden was added to the system. Faced with that policy directive, the K-TRANS staff began to formulate bus service plans for the World's Fair.

REGULAR ROUTE SERVICE

Under the plan of services for the World's Fair that was adopted by KTA, all K-TRANS buses would operate Monday through Saturday from 5:30 a.m. until nearly 1:00 a.m. and 8:00 a.m. to nearly 1:00 a.m. on Sunday. This amounted to a weekly increase of 16,987 miles and 1,273.4 bus hours, which is an increase of 44.1 percent and 45 percent, respectively.

Ridership projections of 40 to 50 percent were quickly surpassed. May and June ridership increased by 67.1 percent and 67.8 percent, respectively. It quickly became evident where additional service was needed, as well as areas where too much service had been added. Extra sections (buses) were operated on several major routes, especially at night shortly after the Fair closed. The Kingston Pike route serving West Knoxville and the Fountain City route serving the northern part of the City typically operated with additional sections.

Kingston Pike serves a corridor consisting of the University of Tennessee, strip commercial development, motels, shopping centers, and a very large segment of middle to upper income suburbia. Fountain City is an older, more established section of middle class neighborhoods that only recently has been impacted by strip development and, during the Fair, temporary motels. With the decline in private shuttle ventures, more Fair visitors at those motels used K-TRANS as their principal travel mode to the Fair.

All service added by KTA and K-TRANS was experimental in nature and in compliance with Urban Mass Transit Administration (UMTA) guidelines. Equity of transportation policy, as well as a greater expectation of latent transit demand for work trips in several areas of the City, caused the K-TRANS staff to plan for the level of service that began operation on May 1, 1982.

Included in the adoption of the World's Fair plan of bus service was the task of monitoring ridership and service levels, which KTA assigned to the Resident Manager. KTA gave the Resident Manager authority to add or delete service as necessary to meet the needs of the community, while staying within the constraints of the K-TRANS operating budget. Ridership was monitored during the evening hours of operation, which resulted in a staff recommendation that evening service be reduced and/or altered. A summary of these service alterations is contained in Table 8-1. This proposal was implemented on Monday, August 30, 1982.

ROUTE CHANGES

Route Restructure

In May, 1981, KTA approved a restructuring of the Kingston Pike Route. The staff recommended that the Kingston Pike-Sutherland Avenue combination be split and operated as two separate and distinct routes. The rationale was that better service could be provided through better scheduling. Service delays causing late buses on one segment of the route were difficult to explain to passengers on the other segement. Additionally, ridership on the Kingston Pike segment was sufficient to justify this segmentation. The proposal was a carbon copy of one that had been proposed in the 1976 Transit Development Plan (TDP), but never implemented due to negative public input. Although granted the authority to change the route, the staff felt it was more prudent to wait until the Fair opened and its implementations became part of the plan of service.

Re-routing

Due to interstate and major arterial improvements prior to opening day of the Fair, several routes had been temporarily detoured. The route detours were approved by KTA in conformity with UMTA emergency route change guidelines.

A major part of the World's Fair site design included the closing of Clinch Avenue. The viaduct was to be rebuilt and turned into a pedestrian bridge lined with festive retail establishments. This closure caused the U.T. Hospital-Fort Sanders Hospital route to change. The route change

ROUTE SEGMENT

Last Departure from Gay Street

	As of May 1st			As of August 30th		
	Weekday	Sat.	Sun.	Weekday	Sat.	Sun.
Route #1						
Holston/Rutledge Pk	12:15	12:15	11:15	12:15	12:15	11:15
Ftn. City	12:15	12:15	12:15	12:15	12:15	12:15
Route #2						
Lincoln Park	12:15	12:15	12:15	11:15	12:15	8:15
North Lonsdale	12:15	12:15	12:15	12:15	12:15	8:15
Route #3						
Davenport	12:15	12:15	12:15	8:15	8:15	8:15
Lonsdale	11:45	12:45	12:45	8:45	7:45	8:45
Vestal	12:15	12:15	12:15	8:20	8:20	8:25
West Haven	11:45	11:45	11:55	8:50	7:50	8:55
Route #4	12:15	12:15	12:15	12:15	12:15	12:15
Route #5						
Sequoyah Hills/ Lyons View	12:15	12:15	12:15	11:15	11:15	11:15
Fairmont/N. Hills	12:15	12:15	12:15	11:15	11:15	11:15
Route #6						
Dandridge	12:15	12:15	11:45	5:45*	5:10*	
Washington Ave.	11:45	11:45	12:15	6:20	5:45	
Route #7						
Vine	12:15	11:15	11:15	12:15	11:15	11:15
Bethel	11:45	11:45	12:15	11:45	12:15	12:15
College Street	12:15	11:55	12:15	12:15	12:15	12:15
Route #8	11:30	11:30	11:35	8:35	8:35	8:35
Route #9	12:15	12:15	12:15	11:15	11:15	11:15
Route #10	12:15	12:15	12:15	11:15	11:15	11:15

*Served by line 1 & 7

TABLE 8-1

would utilize Cumberland Avenue to 16th Street. A benefit of this reroute was increased service along Cumberland Avenue, linking the University of Tennessee, motels, the Fair site and downtown Knoxville. This rerouting "cemented" major traffic generators together and increased penetration into downtown Knoxville.

Due to increased traffic volumes along Western Avenue, the West Haven, College Street and Sutherland Avenue routes were re-routed. The Sutherland Avenue route utilized Cumberland Avenue. The benefits of this change were similar to those of the U.T. Hospital-Fort Sanders Hospital route change. It also eliminated a very treacherous routing through substandard streets located in the Northeast quadrant of the Fort Sanders community. Additionally, the Mechanicsville and Lonsdale neighborhoods were better served by a minor route change. Until the route change, the area was stifled by late service due to heavy traffic on the Western Avenue viaduct.

SHUTTLE SERVICES

Shuttle Services - KIEE

Talks began between Barton-Aschman Associates, Inc. and K-TRANS in early August, 1981 to discuss the Fair's perceived need for transportation services. Since the role of K-TRANS in the Fair transportation system was not clearly defined by KIEE, the K-TRANS Resident Manager made a decision to assume a "wait and see" attitude rather than to commit already scarce resources and staff time to developing programs.

However, K-TRANS did make a firm decision not to pursue the hotel and motel shuttle service. The primary reason was that entry into such a venture without a guarantee of costs was prohibited by KTA policy. Also a new, local private operator had entered the market.

Contract negotiations between KIEE and K-TRANS were hampered by two factors. One was the reluctance of private parking lot operators to commit to contractual obligations made it difficult for KIEE to determine payment on a "per car parked" basis. The uncertainty of the number of spaces, in turn, hindered K-TRANS staff in determining revenue sufficient to cover costs and return some form of profit in order to cover the cost of expanded route service. Additionally, agreement on contractual terms between KIEE and K-TRANS could not be reached. In mid-April, KIEE staff and K-TRANS reached an agreement on a cost per hour basis.

Contract shuttle services operated by K-TRANS for the World's Fair began operation between the Civic Coliseum (Lots CA, CB, CC) and a Willow Street parking lot (Lot W) on May 1, 1982, The shuttle services, and the number of buses initially committed to each, were based on projections received from KIEE as to the attendance for a given day and the estimated times that the largest or lowest number of visitors would be travelling to and from the Fair. There were several variations in peak days and peak hours, all of which changed when it became evident that the actual utilization of these various parking lots would not reach expectations. For example, the schedule for service to the Coliseum area initially required 16 buses Monday through Friday during the peak period from noon to 2:00 p.m. and 18 buses on Saturdays and Sundays during the same time period. Lot "W" (Willow Street) was expected to reach a peak earlier than the Coliseum due to its geographical location and required five buses at its greatest peak.

Both of these parking areas were underutilized during the first week of May. On May 10, service to the Coliseum was reduced from sixteen buses during the peak to six buses. Off-peak service was reduced to only two vehicles.

The Lot "W" (Willow Street) service was reduced from a five bus peak and three bus off-peak to a basic three bus service from opening to closing. This was later reduced to three buses during weekday peak periods and two during the off-peak. Weekend service consisted of two buses operating from opening to closing. Later in the summer, this service was reduced to two buses during the weekend peak and one bus during the weekend off-peak.

The Fair Management Committee decided to terminate parking lot and shuttle contracts, effective July 5, 1982. This decision was a result of several factors, including the underutilization of satellite parking facilities, the "break-even" policy of KIEE, and the need to increase on-site expenditures.

While the Coliseum service was discontinued, the Low "W" and other satellite lots received notices rescinding the termination. K-TRANS continued to operate one bus between the Coliseum complex and the Fair site while adding a stop at the intersection of Central Avenue and Summit Hill Drive. This was at the location of two large unofficial parking lots which had not previously received service, since the KIEE/K-TRANS Agreement only permitted K-TRANS to carry passengers from official parking facilities. This stop was staffed by a K-TRANS Transportation Agent and averaged 150 passengers per day at $1.00 per round trip.

At the end of September, KIEE informed all shuttle bus operators and the participating private parking facility operators that all KIEE shuttle contracts would be terminated at the close of business on October 10 due to lack of patronage. While it was the intent of K-TRANS to continue operations under separate agreements with the various parking lot owners and operators after this date, the need arose to supply this service beginning shortly after six o'clock in the evening of Saturday, October 9th, which was the day that the Fair reached its highest single day attendance of 102,000 visitors. K-TRANS supplied this service because employees of the other KIEE contract shuttle service walked off the job a day early due to the expectation of not being paid.

The request for this service was received shortly after 5:00 p.m. on October 9 and by 6:00 p.m. the additional service was in place and operating without any inconvenience to the passengers. It continued to function without interruption until the closing of the Fair, despite a major commitment of both vehicles and personnel for shuttle service for the Tennessee-Alabama football game played in Knoxville on Saturday, October 16th. A total of 109 vehicles were in service that day in Knoxville, which exceeded the fleet utilization on the opening day of the Fair.

After the contract for Lot "W" was terminated on October 10, K-TRANS continued to operate service under contract to the parking facility owner/operator by providing two buses during the morning and evening peak periods and one bus during the midday and early evening base period. The same level of service was provided seven days per week.

Shuttle Services - Other

Service to REGENCY Parking, a privately owned 5,000 space parking facility, located along Hill Avenue immediately east of the Hyatt-Regency Hotel, appeared to require scheduling twenty-one units during the peak periods and seven during the off-peak. Aside from the opening day of the Fair, this service never required the total number of buses that had been scheduled. On the second day of the Fair, scheduled service was reduced to twelve units. Service was further reduced in the latter part of the first week to six units (peak) and later reduced to a basic service of four during the morning peak and two for the balance of the day. Weekend and weekday schedules were the same. This service was totally discontinued during the early part of the month of June and the facility closed due to lack of patronage.

Shuttle service was operated in connection with "FERRY 82", a private parking lot and ferry boat service. This service operated from the south side of the Tennessee River along Blount Avenue and across from the Fair site. The parking lot initially scheduled four buses to be operated during the peak period and two during the off-peak. After the first two days of the Fair, this was reduced to two buses during the peak period and one during the off-peak. At the end of the first week, a single bus operated from 9:00 a.m. to 11:00 p.m. By the end of the third week, it was evident that this facility would not support both bus and ferry service, and the bus service was cancelled at the request of the owner/operator.

Another parking facility was a privately owned site located on Chapman Highway some three miles south of the Fair site. Due to a late start on construction and an oversupply of parking closer to the Fair site, this facility was never opened to the public and K-TRANS did not supply any services to this site.

Service to the "R-V" parking facility located on Cherry Street at I-40 East was to utilize six buses during the peak periods and three during the off-peak. However, this facility was not fully available during the opening weeks of the Fair and only four buses were utilized during the peak period in the mornings and three for the remainder of the service period. A lack of patronage at the facility later necessitated a reduction in service to three buses in the a.m. peak and two during the base and the p.m. peak. Weekend service consisted of two buses.

The final service area consisted of providing a limited type of scheduled service to a campground facility located in West Knox County in the vicinity of Campbell Station Road. This facility initially required three buses to make three trips from the campground to the Fair site in the morning and one bus to make four return trips in the late afternoon and evening, with the final trip after the fireworks display at night. This service was discontinued after Labor Day as seasonal travel trends indicated that to continue would not be in the best financial interests of either K-TRANS or the operator of the facility.

MAINTENANCE

During the latter part of February, 1982, and throughout the month of March, K-TRANS took delivery of forty new Gruman-Flxible Model 870 coaches, which increased the fleet size by 50 percent. Twenty-nine of these buses were acquired by advancing their scheduled procurement by from one to three years, with UMTA concurrence (UMTA paid 80 percent of the cost). All new buses had been planned as replacements for older equipment, but were used to temporarily expand the fleet to provide additional service.

Several lesser grade mechanics were advanced to Class "A" mechanics to assist in maintaining the fleet. Prior to the start of the Fair, the K-TRANS operation was averaging 24.74 maintenance hours per thousand miles of service. During the Fair, 20.12 maintenance hours per thousand miles of services was maintained. Even with a decrease of 22.96 percent in maintenance hours per thousand miles of service, the fleet was always available to meet service demands.

The Gruman-Flxible Corporation provided three mechanics from their factory staff to aid in accepting delivery, work with the permanent maintenance staff, and generally assist in the maintenance of new vehicles and the training of K-TRANS personnel in connection with this model of bus. Eventually this staff was reduced to one person who remained until approximately the end of August.

Had this staff of fully trained professionals not been available at the crucial time prior to the beginning of the World's Fair, there certainly would have been a need for K-TRANS to employ more mechanics to meet the additional maintenance demands necessitated by having new and unfamiliar bus equipment in service. However, the prominence of the Fair and its reliance on the new buses, plus the direct attention given the new buses by UMTA, caused the manufacturer to give special priority to the K-TRANS situation.

Because of the influx of new equipment and underutilization of the fleet due to reductions in shuttle services, the maximum fleet utilization at the P.M. rush hour was 82 vehicles, or 67% of the total fleet. During that period, 64 buses operated in regular route and express service. This utilization rate was much less than the projected 104 vehicles in peak hour service that had been forecasted by K-TRANS staff. The projections, even as late as May 1, prompted the staff to arrange for tentative coach leasing commitments. Had the forecasted fleet requirements been realized, K-TRANS had commitments for an additional twenty to thirty vehicles from a variety of sources. Only one leased vehicle ever arrived in Knoxville. It went into service on May 1 and was retired from service in August.

The average number of bus units out of service and awaiting repairs numbered nine per day, which included the one bus per week scheduled in the repainting program. Adding these nine units to the maximum utilization of 82 units resulted in a total of 91 committed units. This left 31 units available for service when needed.

The K-TRANS staff arranged for an articulated coach to be provided for line-haul service during the two week period of June 28th through July 9th. The articulated manufacturer (M.A.N.) and the staff felt that this vehicle would receive a tremendous work-out in service. The vehicle

was used in line-houl service on the Kingston Pike, Fountain City and College Street/McCalla Avenue routes. Its usage eliminated the need for double-sections during a.m. peak travel. The greatest usage was during the shuttle service operated between the Coliseum and University of Tennessee football stadium on July 4th, when the articulated coach made numerous trips carrying in excess of 125 passengers. This is double the capacity of a standard coach in similar service.

Additional vehicle service personnel were employed to create a midnight to 8:00 a.m. shift of coach servicing personnel to service those vehicles which returned to the garage from both regular route and special shuttle services after the usual 12:30 a.m. shift ending time. During the latter stages of the Fair, only a single shift was employed on weekends because the World's Fair shuttle services had decreased to a point where this extra shift became unnecessary.

The ability to clean and fuel the fleet in an efficient manner was a result of the installation of an additional diesel fuel pump, a 30,000 gallon fuel tank, and a fully automatic bus washer. The washer, installed as part of a previous UMTA Section Five Capital grant, replaced an obsolete and inefficient two-brush washer.

PUBLIC INFORMATION

An informed public was a primary aspect of the K-TRANS plan of services during the World's Fair. Consequently, plans began nearly a year before the Fair to secure additional funding for passenger information aids. A grant was filed with UMTA under the 4(i) program. The original plan concept was based on the grant paying the planning and operational costs of the marketing program during the Fair. However, due to various factors, the 4(i) program announcement of eligible programs did not occur until May, considerably after the time originally needed for setting up the program. Actual expenditures against the grant were not eligible for reimbursement until July 2, 1982. As opening day of the Fair neared, the Resident Manager made the decision to proceed with the Public Information Program without federal participation.

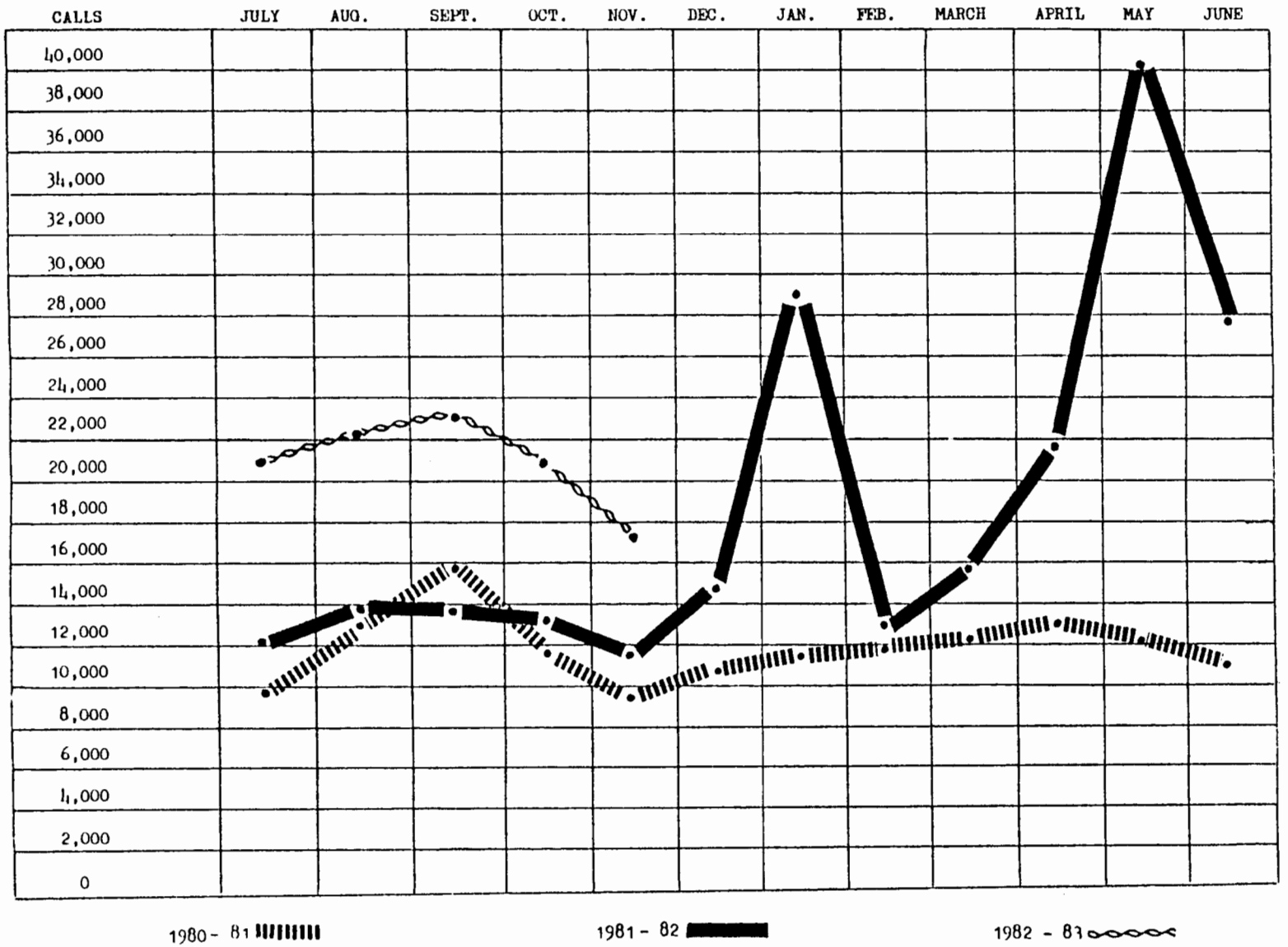
During the months of February and March, a modular building was obtained and outfitted as a telephone information center. Originally there was to be a staff of twelve working various shifts. Although the center was open seven days a week from 6:00 a.m. to midnight, only eight people were hired. Hours of operation were reduced during the duration of the Fair as telephone calls to the center decreased and calling patterns were established. Table 8-2 and Figure 8-2 show a comparison of telephone calls since July, 1980.

TABLE 8-2

TELEPHONE INFORMATION CALLS

1980-1981 YEAR		1981-1982 YEAR		1982-1983 YEAR (To Date)	
July	9,333	July	11,680	July	20,028
Aug.	12,406	Aug.	13,111	Aug.	21,769
Sept.	15,210	Sept.	13,102	Sept.	22,165
Oct.	11,465	Oct.	12,846	Oct.	20,024
Nov.	9,406	Nov.	11,349	Nov.	16,675
Dec.	10,062	Dec.	14,013		
Jan.	11,135	Jan.	28,475		
Feb.	11,278	Feb.	12,414		
March	11,888	March	15,193		
April	12,684	April	21,395		
May	11,538	May	39,768		
June	10,895	June	27,107		

FIGURE 8-2
TELEPHONE COMPARISON CHART



Extensive radio advertising occurred during the duration of the Fair. Through humorous sketches, the K-TRANS telephone number for transportation information was emphasized. Public awareness of K-TRANS increased during the Fair and appears to be continuing as a by-product of the Fair.

A number of temporary bus stop signs were installed around town. These were constructed of a galvanized post welded to a bus brake drum and printed in orange and white. The signage took the form of aluminum sheeting, Almac Guide-A-Rides or cylindrical TRANSI-TUBES. The signs were custom made and the style selected depended on the availability of material and/or product.

A joint public-private venture in the form of a large multi-color route map was a critical item to the success of transit in Knoxville. In cooperation with Hardee's Restaurant, the tenant of the Sunsphere theme structure, 25,000 maps were produced. The maps featured a panel of advertising for the Sunsphere. In exchange for sponsorship of the maps, K-TRANS sponsored radio advertising announcing their availability. Bus operators distributed the maps on buses and Hardee's displayed them in their local restaurants. A reprint of the map was produced and distributed during October. The map was jointly sponsored by a local radio station, fast food franchise, K-TRANS, and the 4(i) project.

LABOR

Labor negotiations for a new two year contract began in December, 1981. One of the K-TRANS proposals would have allowed for part-time operators during the start-up and duration of the Fair. During the collective bargaining process both sides agreed to the concept of temporary operators. These personnel would be hired at 65% of top operator wage rates and would work a proposed forty-hour week, without a guarantee of forty-hours. No other benefits, as defined in the collective bargaining agreement, would be granted to these employees.

In the maintenance and office classifications, personnel would enter at the starting hourly rate and not be subject to progression or any other benefits. Clerical, telephone information personnel, and shop personnel all began work in mid-April.

During the months of March and April, 75 bus operators were hired and trained. Each new operator had to qualify in the same manner as a full-time employee. The training program, lasting 21 days, was then followed by a 60 day probation period at $7.02 per hour (65% of top operator wage). As service levels were reduced during the Fair, reductions in bus operator ranks was accomplished through attrition. When the Fair closed, only 59 temporary operators were employed.

CONCLUSIONS

Public transportation in Knoxville received a significant increase in ridership during the Fair. K-TRANS demonstrated that it could provide quality transit service and meet the needs of the general public. The long term effect will be measured in increased ridership and a broadened base of community support. Both elements are critical to the continuance of public transit in an era of dwindling public dollars for city services.

KIEE's decision to make transportation a "break-even" operation, coupled with a need for K-TRANS to break-even (by City of Knoxville directive), created difficulties in contract negotiations. Additional time to come to terms on contract differences should have been provided for in the negotiating schedule.

Looking back on the events during the Fair, it can be safely stated that K-TRANS could have provided all of the parking lot shuttle bus services for KIEE as well as other commitments that it made with private businesses for the transportation of visitors to the Fair. As the Fair progressed, K-TRANS did assume this role.

Labor and management worked closely throughout the Fair and the system benefitted by this cooperation. Flexibility and the acceptance of rapid change by all employees were also critical elements.

An earlier and clearer definition of the role of K-TRANS in providing transportation for the Fair might have resulted in K-TRANS providing all of the necessary shuttle service from the start of the Fair. In addition, earlier information on the exact number of available parking spaces would have allowed K-TRANS to more accurately determine the cost of providing the service.

CHAPTER 9

PEDESTRIAN MOVEMENT

Off-site pedestrian movement for the 1982 World's Fair was planned to result in minimum conflict with traffic flows. This was accomplished through locating gates away from major vehicular traffic volumes where possible. In addition, major pedestrian movements were routed so they need only cross relatively minor streets. In one case a pedestrian bridge was built to avoid conflicts between major pedestrian and vehicular movements.

CHARACTERISTICS OF PLAN

Due to the relatively low number of lodging facilities within walking distance of the Fair, most people had to drive or ride a bus to reach the site. The majority of parking spaces were located either immediately adjacent to a gate or required crossing minor streets to reach a gate. Bus stops and terminals were located immediately adjacent to gates or were accessible without crossing streets at grade.

Pedestrian queuing space was provided adjacent to each gate. With the exception of a few days early in the Fair, queues did not extend to public sidewalk areas. This was done to avoid conflicts with pedestrians moving past the gate areas. Most major passenger loading zones, such as those for city bus and taxi pick-up/drop-off, were located adjacent to gates along sidewalks. Activity at these locations was relatively low and created no conflicts with pedestrians moving past these zones.

SPECIAL NEEDS

Gate Queuing Areas

The queuing areas have already been mentioned above. Queuing areas at the west and southwest gates were adequate. Queuing areas at the north and east gates were not as large as had been desired, primarily due to a shortage of available space. After the first week of operations, gate staff had become efficient enough in handling queues so that few problems resulted. The north gate handled as many as 10,000 people entering per hour.

Sidewalks

The City of Knoxville replaced or repaired all damaged sidewalks in the downtown and around the perimeter of the Fair site. This involved replacing 10 to 15 percent of the sidewalks in the target area at a cost of approximately $150,000. Handicapped ramps were installed, if not already existing, where these sidewalk repairs were made. Except in conjunction with other improvements, no sidewalks were widened.

One location where pedestrian conflicts required special attention was at the entrance to the north bus terminal. During peak Fair inbound and outbound periods, heavy pedestrian movements coincided with heavy bus movements to and from the terminal. Nearly all persons walking from the 2,000 parking spaces along Dale and Blackstock Avenues reached the north gate by walking on the west side of the bus terminal. The pedestrian entrance was immediately adjacent to the bus entrance to the terminal. Although a sidewalk was provided on the north side of the block west of the entrance, most pedestrians walked on the south side of the street. This resulted in large numbers of pedestrians walking in the right lane of a two-lane street heavily utilized by buses. During peak periods, police control was necessary to reduce conflicts between pedestrians and buses.

These conflicts would have been reduced if the major pedestrian access to the north gate had been separated from the bus terminal access point. Land availability and configuration precluded such a separation. Widening the pedestrian zone on the west side of the terminal, to compensate for the lack of separation between pedestrians and buses, was effective in the terminal, but not on the adjacent street or at the terminal entrance.

Crosswalks

Crosswalks already existed around most of the perimeter of the Fair and in downtown. All crosswalks were repainted prior to the opening of the Fair. A few additional crosswalks were painted at intersections expected to have high pedestrian volumes during the Fair. These were located primarily adjacent to Fair gates. No mid-block crosswalks were striped, nor was it felt that any temporary crosswalks were needed. One additional crosswalk was requested by City Police after the Fair opened.

Jay-walking did occur around the Fair site, although not in a greater magnitude than would ordinarily be expected. This is partially due to the fencing around a number of parking lots which diverted pedestrians to intended crossing points.

It is doubtful that additional crosswalks would have changed pedestrian movement patterns. However, additional fencing around parking lots would have reduced some jay-walking. However, such fencing would have increased costs beyond what many operators felt they could risk. Since no pedestrian-vehicle accidents attributable to jay-walking were recorded during the Fair, it is questionable if additional attention to this area would have been cost-effective.

Pedestrian Signal Changes

Pedestrian signals were installed along Henley Street and at Cumberland Avenue and 11th Street. No additional pedestrian heads were installed at signalized locations, nor were additional pedestrian signals installed. However, several signs were changed to international legends.

The traffic signal timing along Henley Street originally included only short pedestrian walk phases for persons crossing Henley Street. This street consists of six lanes separated by a wide median which required more time to cross than was available in one pedestrian phase. Prior to the Fair, it was necessary to cross from the sidewalk to the median, wait until the next walk phase, and then cross from the median to the other sidewalk. Observance of pedestrian signal control was spotty and many persons crossed against the "wait" indication. Signal timing was modified to permit pedestrians to cross Henley Street in one walk phase, primarily by shortening the clearance interval and making other minor timing modifications. This appeared to work well, with few people crossing against "wait" signs and relatively few vehicle/pedestrian conflicts.

Pedestrian Bridge Across Henley Street

From the inception of planning, it was evident that a pedestrian bridge would be needed across Henley Street to minimize vehicle/pedestrian conflicts. The heaviest pedestrian movements into the Fair were expected to cross Henley Street at Clinch Avenue, which was also one of the most heavily travelled streets in the City. In addition, it was decided to locate the main Fair shuttle bus stop one block east of the east gate on Locust Street to minimize adverse impacts of stopped buses on passing traffic. Because the elevation of Locust Street is over ten feet above Henley Street, it was possible to construct a pedestrian bridge from Locust Street over Henley Street and into the second floor of the office building on the Fair site without requiring pedestrians to go up and down stairs.

This bridge, financed through an UMTA capital grant, was used continuously by bus passengers since it was adjacent to a new bus stop on Locust Street and by others walking from downtown to the east gate. The long-term objective of the bridge was to connect the East-West Mall, which will extend through downtown across Henley to the Fair site and the Exhibition Center.

The new bridge was located along the heaviest east-west pedestrian route. However, more people crossed Henley Street at grade with the pedestrian signal at Clinch Avenue than walked over the bridge at the same location. Some of these people walked down Henley Street toward the Fair's east gate and chose not to walk a block away from the Fair to reach the pedestrian bridge. It is unlikely that greater use of the bridge could have been achieved without using barriers to prevent at-grade pedestrian crossings at Henley Street at that location. However, some increase in bridge use could have been achieved through directional signing pointing pedestrians to the bridge, especially on the downtown side of Henley Street.

CONCLUSIONS

Overall, off-site pedestrian movement never was felt to be a major transportation issue or problem. The concept of trying to route as many people as possible on the Fair side of major streets was sound. Provisions made for others crossing major traffic flows appeared to be adequate. Considerable traffic and pedestrian congestion would have occurred adjacent to the east gate if the pedestrian bridge had not been constructed, especially since no alternate location was available for the main parking lot shuttle bus stop on Locust Street.

For future events of this type, pedestrian movement difficulties can be minimized by avoiding plans that require large numbers of pedestrians to cross major streets. Pedestrian signals at major crossing points are beneficial, but must be supplemented by police control during high pedestrian volume periods.

CHAPTER 10

OTHER MODES OF TRANSPORTATION

The prospect of serving the Fair visitors' transportation needs attracted many proposals to provide transportation services of one sort or another. Firms and individuals who wished to operate services on the Fair site or use Fair property for terminals approached KIEE for approval. Those who wished to operate on the public streets approached the City of Knoxville and/or other agencies having regulatory powers. Some of these operations are dealt with in other chapters of this report. For example, a prospective bus operator's contacts with KIEE and the City are covered under the shuttle bus heading. This chapter discusses several forms of transportation that were proposed, the agencies contacted, and the disposition of the proposals.

TRI-SHAWS

Tri-shaws are bicycle-powered rickshaws carrying two passengers and propelled by a driver. One out-of-town entrepreneur obtained a license from the City Business Tax Office to operate such a service in and around Knoxville. The service began with five tri-shaws and another six were added in the middle of April. However, during the last few weeks of the Fair only six or seven tri-shaws were operating. Students at nearby colleges and universities were hired as drivers and paid on commission. The average wage per driver was $3 to $4 per hour and ranged between $7 and $14 per hour during periods of heavy demand.

The tri-shaws were on the streets between the hours of 8 a.m. and 2 a.m. and were available the remaining six hours on a call-in basis. Although the tri-shaws could travel throughout the City, 90 percent of the service occurred within a one mile radius of the Fair site. Most requests were for short-haul trips by visitors to the Fair and occasional novelty trips for Fair employees and local residents. Customers were charged according to the amount of time they rode, with the average trip costing $2 to $3.

On the positive side, the tri-shaws added a touch of foreign atmosphere to the downtown area adjacent to the Fair and required no public facilities investments. On the negative side, tri-shaws in the curb lanes on some of the hilly downtown streets in Knoxville occasionally created mini-traffic jams by restricting flow. The vehicles are not compatible with

automobile traffic under normal travel conditions. With hindsight, they might have been restricted to certain side streets, required to cross major streets at crosswalks rather than merge across traffic, or barred entirely.

FERRY BOATS

Several boat services operated on the Tennessee River to the public docks adjacent to the Fair site. One entrepreneur shuttled back and forth between the Fair and a marina/remote parking complex directly across the river. There were three boats at the disposal of the operator, two of which he owned and another which was leased. The boats had capacities of 18, 39, and 48 passengers and ran continuously during the hours the Fair was open. The five minute trip across the river cost $2 per person with no charge for children under the age of four.

At least one operator began daily service from a community in Blount County some miles down river, bringing visitors to the Fair in the morning and returning them in the afternoon. The trip took two hours, leaving Blount County at 8 a.m. and returning at 9 p.m. The fare was $17.50 for a round trip ticket, which included breakfast, and $8.50 for a one-way ticket. There was no charge for children under the age of three.

The 300 passenger vessel averaged 250 to 270 passengers daily until July when the number of passengers decreased to around 60 passengers per day. At the beginning of August the operator discontinued service and returned the boat to the lessor. In addition to shuttle service, the boat made runs to see the nightly fireworks and was chartered by organizations such as civic groups for luncheons and dinners.

Another firm, under license from the Fair, offered boat rides on the river in a replica of a sternwheel steamer, with cruises of varying lengths at different times of the day.

At one point KIEE considered a ferry shuttle from a remote parking lot location. The idea was abandoned because there was no full-service visitor gate (selling tickets as well as collecting them) to admit visitors at the dock area and it was evident there were enough licensed river pilots for that stretch of the Tennessee River to provide the service level KIEE would have required. As with the other operations being conducted or planned in the private sector, it was not clear this service could operate under all weather and light conditions.

According to the Coast Guard, it is impossible to determine how many boats obtained licensing in order to provide service to the World's Fair. Both boats and pilots have to be licensed separately and there is no way to geographically locate the service areas of either the pilots or the boats. In addition, once a boat is licensed the Coast Guard does not know whether it actually operates nor the duration of time it provides service. To further complicate the matter, one operator claimed there were several illegal boats providing service also.

River transportation never was a significant portion of the Fair's transportation system, serving rather as a convenience for a few visitors and a novelty or part of the Fair experience for a somewhat larger number. Parking areas on the south side of the river did poorly in competition with the lots on the same side of the river as the Fair. In general, shuttle bus transportation served those visitors who parked in the South Knoxville lots.

HORSE-DRAWN CARRIAGES

The City Division of Public Transportation Services received three proposals from entrepreneurs wishing to provide transportation and/or sightseeing service in downtown Knoxville and around the Fair area by horse-drawn conveyance. Some of the proposals drew an analogy to the carriage tours of Charleston, South Carolina and suggested that a similar tourist attraction could be developed for Knoxville. Even though the City Division of Public Transportation Services is only responsible for regulating motorized vehicles, it denied the applications in light of the steep and narrow downtown streets, the potential increase in traffic congestion, the horse manure nuisance, and the objections of the City Police Department and the City Traffic Engineering Department. Upon appeal, the Knoxville Transportation Authority also denied the applications.

HELICOPTERS

Both KIEE and the City were approached by a number of firms wishing to operate helicopter sightseeing rides over the Fair site. KIEE had also leased exhibit space to a helicopter manufacturer who, it developed, wanted more than a static display. The KIEE management was strongly opposed to allowing helicopters or any other type of fixed-wing aircraft flight over the site at low altitude for safety reasons. For similar reasons, KIEE refused to allow helicopter landings on the site. After a series of meetings with the FAA, the City, and the Tennessee Bureau of Aeronautics, KIEE management requested establishment of a temporary restricted airspace zone around the site to prevent unauthorized aircraft operations. However, it was not possible to prevent helicopter operations from existing helipads near the site.

When the Fair opened, one commercial helicopter operator who had been denied a permit by the Army Corpos of Engineers to operate from a barge on the Fair side of the river was providing sightseeing rides from a heliport just across the river from the site. Another operator was providing rides from a heliport on a small plot of public land about two blocks from the north gate near the intersection of Summit Hill Drive and Dale Avenue. This heliport had been authorized by the City due to pressure from aviation trade interests. The latter operator used private funds to construct the heliport facility since the City refused to invest public money. However, this operator had ceased to operate by the end of August.

Several months before the Fair opened, another entrepreneur attempted to capitalize on the anticipated traffic congestion by offering a helicopter commuter service for executives. It was to pick up passengers in suburban areas (some 10-20 miles out) and deliver them to existing rooftop heliports in downtown Knoxville or other convenient locations. This service, which cost approximately $390 weekly per person, never actually operated.

AIRSPACE RESTRICTIONS

As noted above, KIEE was concerned about the possibility of accidents associated with low-level flight over the Fair site. The FAA was concerned with overall air safety, including separation of traffic which might wish to conduct sightseeing operations near the Fair while en route to or from a local airport. KIEE requested a temporary airspace restriction which the FAA did not grant.

The FAA views airspace restriction as a last-resort measure, since it can have economic repercussions on commercial operators. It may also interfere with existing operations, such as the flights conducted from the heliports on top of several downtown Knoxville buildings. After discussions with area aviation operators, the FAA opted to publish special air traffic control procedures and to re-open the control tower at the Downtown Island airport. This tower, some three miles from the Fair site, had been closed following the air traffic controllers' strike.

The airspace within five miles of an airport with an operating control tower and up to 3000 feet above ground level is considered within the airport's traffic area. All aircraft flying within the airspace are required to contact the tower prior to entering the area for permission to enter the airspace even if they are not landing at the airport. The FAA recommended a counter-clockwise traffic pattern for sightseeing near the Fair and provided advisories about other traffic in the area. Positive separation was never provided, but the level of traffic that developed posed no problems.

RAIL SERVICE

Perhaps the most persistent marginal mode the KIEE staff had to deal with was proposed rail service. There were several different types of service proposed. One type was long distance excursion trains that would bring passengers to the Fair in the morning and take them home at night. They would begin in such places as Asheville, North Carolina, which is 120 miles from Knoxville. Other proposals included luxury trains which would serve as sleeping cars for longer-term visitors and a shuttle service to carry motorists from a parking facility to be constructed in an old rail yard three miles north of the Fair. It was difficult to explain to proposers why their ideas were impractical because there were tracks on the Fair site over which trains operated nightly when the Fair was closed.

The most basic reason rail service to the Fair was not implemented was that the railroads controlling trackage to Knoxville and the Fair site were adamantly opposed to such operations. Even had those objections been overcome, economics did not appear to make it possible to incorporate rail shuttle service from remote parking lots as a viable part of the Fair's transportation system. Most of the proponents of rail service sought some sort of subsidy directly or indirectly from the Fair for such service. Third, the railroad trackage and yard layout adjacent to the Fair was such that there was no safe, convenient place to stop a train and unload it outside the Fair gates. Space between and adjacent to the rails inside the Fair had been paved because it was needed as part of the service spine and pedestrian walkway system of the Fair. Thus, institutional, economic, and physical issues were all adverse to rail operation.

It should be noted that rough estimates by the KIEE transportation consultant indicated that unloading shuttle trains at low level platforms would have required such long dwell times as to make trains impractical for parking lot shuttle service. Constructing high platforms for rapid loading and unloading was not justifiable for economic reasons.

COMMERCIAL AIR SERVICE

Scheduled airline service to Knoxville increased during the World's Fair. One carrier operated larger capacity aircraft on a route serving Knoxville. Another carrier initiated service to Knoxville as a market previously not served. A tour operator offered a one-day package tour

from Chicago to the Fair, including round-trip airfare, ground transfers, and admission to the Fair at a price lower than one-way airline coach fare between Chicago and Knoxville. Despite the added activity, however, air travel does not appear to have been a major mode of arrival at the Fair.

Before the opening, several local bus companies competed vigorously before the Public Service Commission for right to provide service between the airport and the Fair. Yet, only two "new" carriers offered service to the airport. In both cases, it fit well with other locations they served.

The Knoxville Airport Authority was not directly involved in planning transportation services for the Fair, nor did they approach the Fair to indicate any problems related with handling an influx of Fair visitors. Based on this experience, it may be inferred that existing institutions and enterprises are capable of handling the air travel demand associated with such an event without direct intervention from either the public sector or the event organizers. The situation would, of course, be somewhat different for an event like the Olympic Games, in which the organizers do bear responsibility for providing ground transportation arrangements for participants and other official visitors. However, in such an event, the organizers are very likely to have to procure ground transportation services from the existing providers in the area.

INTERCITY BUSES

Greyhound and Trailways both ran scheduled daily bus service direct to the World's Fair from various cities, most of which were within four hours' driving time. Additionally, several smaller North Carolina and Tennessee carriers provided service direct to the Fair from communities within a 100 to 150 mile range. These operations were generally accommodated in the charter and tour bus terminal, although the distinction between these operations and shuttle services was a rather fine line. In practice, Greyhound and Trailways accommodated their schedules as part of their regular dispatch procedures, but assigned specific loading locations for the scheduled services wherever possible. KIEE staff assigned the long-distance shuttle services operated by smaller carriers to short platforms at the far end of the terminal and allowed those buses to bypass the check-in procedures when arriving at the Fair in the morning. Aside from the location, these services functioned the same way as shuttle services in all respects except terminal location.

KIEE was occasionally asked to support an application before the Tennessee Public Service Commission or the Interstate Commerce Commission for rights to serve the Fair. The Fair's response in all such matters was to offer a letter indicating the need for good bus service to accomplish the transportation goals of the Fair by providing high quality, high

capacity, and high occupancy service. Since KIEE was, in any case, going to have to accommodate the volume of bus traffic that developed, regardless of the number of carriers involved, there appeared to be little point or justification in becoming involved in issues of economic regulation. See further comments on this subject in Chapter 7.

TAXI SERVICE

Knoxville experienced a large influx of taxi cabs just prior to the Fair. In addition to fleet expansion by existing Knoxville cab companies, a number of new firms applied to the City for permission to provide taxi service within the City's jurisdiction of the Knoxville City limits. The City was placed under great pressure to increase the number of taxi licenses by over 175 percent, resulting in a total of approximately 275 taxicabs servicing the City. A number of van services, offering what amounted to a ride-sharing taxicab service, also emerged. At least one of the new taxicab operations proposed to offer both shared-ride taxi and shared-ride van service.

In cooperation with KIEE staff, the Police Department and the City Traffic Engineer's office designated appropriate locations for taxi stands near each Fair gate. Capacity of the stands was dictated by safety considerations and curb availability. The City found itself short-handed with regard to inspection and monitoring of cab service. Consequently, a number of reported abuses by cab operators did not result in withdrawal of operating licenses by the City.

At the start of the Fair, an excess supply of taxicab service existed. Over the course of the Fair, operators withdrew from the market and/or reduced fleet sizes to more nearly parallel demand. By the middle of the Fair's run, taxi's were reduced to close to the pre-Fair total of around 100. However, by the end of the Fair this number had increased by 25 to 30 percent. The shared-ride van services appeared to be doing well since they had the capacity to accommodate large family parties with ease.

Early in the Fair, it was noted that cabs and vans were not adhering to the posted maximum (metered) prices allowed, but were competing to offer rides at $1.00 per person within the central area of the City and $2.00 for longer rides.

The proximity of the bus terminals to the north and southwest gates resulted in a persistent problem of intrusions by taxicabs into the bus terminal areas. The terminals were strictly off-limits to private automobiles, taxicabs, and all other vehicles except authorized buses. A number of cab drivers were warned they would be cited for trespassing and/or reckless driving if found in the terminal again. Telephone calls and letters to the cab companies kept the problem within manageable proportions, but did not eliminate it entirely.

It should be noted that space limitations prevented taxicab loading areas from being included in the terminal designs, rather than a deliberate attempt to exclude them. If space permits in future events, provision for cab loading zones and a modest taxi waiting area should be provided adjacent to Fair gates.

CAR RENTAL

Car rental agencies which had offices in Knoxville prior to the Fair expanded their fleets and at least one Florida rental car operator attempted to find utilization for his fleet during the Florida slow season. Avis, the Official Car Rental Agency of The 1982 World's Fair, held discussions with KIEE staff early in 1982 about preferred parking space for Avis cars at the Fair, but ultimately made arrangements elsewhere. As far as can be determined, all other arrangements involving rental car operation and services at the Fair took place in the private sector. Some fleets may have been rented and operated as part of package deals put together by tour brokers. KIEE was not involved in this type of operation in any way, nor were any governmental agencies, beyond normal licensing and insurance considerations.

CONCLUSIONS

There was much interest in providing transportation directly to the Fair utilizing various modes other than private autos and buses. Some of the more predictable were taxis, limousines, intercity scheduled buses, and trains. Less predictable were helicopters, horsedrawn carriages, and tri-shaws.

Motorized vehicle services were allowed to operate under free-market conditions. As with parking lots and shuttle buses, the "speculative fever" resulting from over-optomistic economic expectations affected taxi operations. They started out too plentiful, but quickly shrunk back to levels supportable by demand. Other modes either failed to start operation for any number of reasons or operated as novelties. None of these modes carried a significant percentage of Fair visitors.

Commercial scheduled airline service was increased. Most people who came by air stayed overnight and traveled from the airport to their lodgings and then to the Fair. Thus, there was never any measurable demand by visitors to go directly from the airport to the Fair.

A lead time of six months should be available to license new or additional transportation operators and to check each operator's background for financial soundness and moral character. Since there was no application cut-off date in Knoxville, there was not enough time available to properly check out many operators.

CHAPTER 11

ELDERLY AND HANDICAPPED PROVISIONS

The Fair site was designed to be fully accessible to the handicapped. Each entrance gate was equipped with a bypass around the turnstiles to accommodate visitors in wheelchairs. The bus terminals were barrier-free in the sense that there were no curbs to mount between the unloading areas and the Fair gates themselves. By Tennessee State law, free parking for the handicapped had to be provided at a convenient location. This was achieved by designating the small parking lot closest to the north gate as the handicapped parking lot. It was signed and publicized that parking for the handicapped was available at that location.

OPERATING EXPERIENCE

Rest Areas

The only significant operating problem encountered was the lack of adequate benches and shade, which were a greater hardship on the elderly than on younger visitors.

Parking

The handicapped parking lot had a capacity of 40 vehicles. On most days, this capacity was more than sufficient. However, the capacity of the lot was exceeded on some days. Because the lot was immediately adjacent to the north bus terminal, it proved feasible to park cars in a high density configuration on those few days. This meant allowing late-comers to park in such a fashion that they blocked cars that had arrived earlier. KIEE staff were advised where the keys for late-arriving vehicles of handicapped visitors could be found, in case those vehicles had to be moved to allow earlier arrivals to exit the lot. Although this practice is not recommended because of the liability issues raised for the Fair, it proved expedient at the time.

Enforcement of the handicapped-only feature of the parking lot proved difficult. With only 40 spaces, the lot was too small to warrant a full-time attendant. Not all states have a uniform manner of designating vehicles driven by the handicapped, nor was there any satisfactory way of identifying vehicles whose owners or drivers were not disabled, but which carried disabled passengers. It was felt these vehicles were

entitled to park in the lot. Yet, it was difficult to tell whether the vehicle was authorized to use the lot if no one from KIEE staff observed the passengers alighting from the vehicle. Cars were towed from the lot very infrequently since the public relations consequences of towing a vehicle that belonged in the lot, but did not appear to, were adverse and substantial.

The location of the lot, unfortunately, was across Blackstock Avenue from the north gate of the Fair. This created some difficulties for visitors in wheelchairs, who had to negotiate not only the street, but also a railroad crossing. In hindsight, KIEE could have improved movement by paving the lot instead of the tar and chip surface.

In general, a preferred location for a parking lot for handicapped visitors is in a barrier-free location immediately adjacent to an entrance gate. Care should be taken to avoid grade changes, railroad crossings, and similar barriers between the parking space and the gate. Parking areas should be paved.

It was noted that a substantial number of handicapped visitors to the Fair chose to pay the $6.00 parking fee to park in a private enterprise lot on the same side of Blackstock Avenue as the gate and immediately adjacent to the bus terminal. Although this lot was not paved either, the lot operator accommodated the handicapped by making available those spaces closest to the Fair entrance.

Bus Terminals

Handicapped visitors arriving in buses appeared to be able to use the terminal facilities without any particular special treatment. It was necessary to make an accommodation by allowing the bus to remain in the terminal longer than the normal dwell time only in a case where several visitors requiring wheelchairs arrived in the same charter bus.

A private carrier, specializing in tours for the handicapped, sought and obtained permission to park a motor home used to transport handicapped visitors to the Fair. This vehicle, which spent as many as four days per week at the Fair, was parked in the bus terminal as close to the gate as could be arranged without interfering with the orderly flow of bus and pedestrian traffic. The tour operator informed KIEE staff that the nature of the disabilities of some of the passengers made it highly desirable for a convenient resting place to be available to them during the middle of the day, as well as a place to keep medication, special diets, etc. Since the internal facilities on the Fair site had no such provisions, the motor home parked in the terminal presented an ideal solution. Future designs would do well to consider making provision for one or two large vehicles serving the handicapped in a bus terminal if space permits.

No extraordinary provision was made for handicapped visitors arriving at the Fair on the regular Knoxville bus routes. Bus stops already existed near the east and west gates of the Fair and the pedestrian overpass over Henley Street (see Chapter 9) was directly connected with the shuttle bus terminal for remote parking lot shuttles at Locust Street. This overpass was built with Federal funds in time for the Fair and was accessible to the handicapped, although there were some stairs at the end of it.

Pick-up/Drop-off Areas

Fair visitors in private automobiles occasionally arrived at the bus terminal entrances and insisted on being allowed to drop-off or pick-up their handicapped passengers directly adjacent to the gate. This was generally not permitted, since it interfered with the safe and efficient flow of bus and pedestrian traffic in the terminal areas. However, toward the end of the Fair, the terminal operating staff determined that it was possible to admit private vehicles serving the handicapped to the terminal during slack hours. These cases were decided on an individual basis. Otherwise, elderly and handicapped persons could be served at passenger loading zones located near each of the other three gates.

CONCLUSIONS

Benches

The 1982 World's Fair was heavily attended by the elderly. Handicapped persons also attended, but not in as large numbers. The greatest need of the elderly was shade and seating inside the site and at bus terminals. Both of these were in relatively short supply during unseasonably warm weather early in the Fair. Numerous cases of heat prostration involving mainly elderly and overweight visitors occurred. During peak periods seating always seemed to be available in less quantity than was desired by visitors, despite increases in seating within the Fair and in the terminals. A disproportionally large segment of the elderly attended the Knoxville fair in tour groups. Thus, bus terminals should be supplied with at least one bench per bus.

Access Provision

Special parking and accessibility features should be built in since the handicapped attend Fairs in significant numbers. This includes passenger loading zones at each gate, turnstile bypasses, ramping to make grade changes, and special bus loading and parking areas as well as parking facilities for personal vehicles adjacent to at least one gate.

Public Information

Numerous information inquiries regarding special facilities for the handicapped were received and can be expected at future fairs. An information brief should be prepared and made available to whoever provides general information on the fair to telephone callers.

CHAPTER 12

TRANSPORTATION AND EMERGENCY SERVICES

The Fair operated a well-staffed, well-equipped Emergency Services Division with ambulances and mini-ambulances, fire trucks, and para-medic services. This division responded to over 40,000 various emergency calls during the Fair. The Emergency Services Division interfaced with Transportation Services at several points, as did the Fair's Security Division. Emergency Services was responsible for providing assistance to Fair visitors in the bus terminals, even though they were technically outside the Fair gates. Security was responsible for security in bus terminals, Fair VIP and close-in employee parking lots, and the Fair's official parking lots operated by KIEE's contractor. However, if a situation developed which was beyond the ability of KIEE's unarmed security guards to control, the Knoxville Police Department was called. The following paragraphs cite some of the situations that developed and the issues which they highlighted.

PARA-MEDIC SERVICE--BUS TERMINALS

The para-medics were very timely in responding to calls from the bus terminals and attended numerous victims of ailments ranging from sprained ankles through heat stroke to a cardio-vascular incident. Although all Transportation Services staff were trained to call Emergency Services if a visitor required medical assistance, no specific emergency plan had been worked out. In the Fair's early weeks, the para-medics sometimes had difficulty locating the visitor needing help. The ambulance driver would be dispatched to the bus terminal, but if he/she entered the terminal at the exit end to avoid traffic at the entrance, the driver might find that no Transportation Services person at that end of the terminal knew where the victim was. Ultimately a coordination arrangement was worked out to insure that terminal staff knew where to direct the emergency vehicle.

Overall, need for "on-street" ambulance calls totalled 250 to 300 per month. On-site mini-ambulances responded to a total of 4,000 calls, and another 4,000 were handled with golf carts.

An agreement on who would cover what area was reached between KIEE and the City ambulance service. The arrangement proved successful. Additionally, an agreement was reached with the larger, local taxi companies to transport visitors in emergency situations when ambulances were unavailable.

FIREFIGHTING--BUS TERMINALS

A potentially more serious incident occurred within the first ten days of the Fair when a visitor carelessly discarded smoking materials which set fire to a railroad tie being used as a wheel stop in the bus terminal. In this case, the Fair's fire squad had difficulty locating the bus terminal. A review with the head of Emergency Services verified that the terminals were within their jurisdiction, but that not all staff had been fully briefed on their locations.

A total of 150 fire calls were answered on-site, plus 50 calls on the water (marine).

SECURITY--BUS TERMINALS

As mentioned previously, the Fair hired uniformed off-duty officers to guard the entrances to the bus terminals, to direct traffic on the street at the entrance, and to keep unauthorized vehicles out of the terminals. These officers had full police powers. After the first few weeks of the Fair, however, they were only on duty during the peak hours of approximately 8:30 A.M. to noon and 6:00 to 10:30 P.M. In several cases it was necessary to call the City Police to arrest drivers of vehicles that had illegally entered the terminals and refused to leave.

There were also a number of street vendors who attempted to sell souvenirs and similar merchandise in the bus terminals, which was strictly prohibited. Transportation Services staff asked these people to leave the terminal. If they refused or returned, terminal staff would call the KIEE security staff, who would make the same request. If the vendor persisted, Security would call the City Police and file charges.

SECURITY--PARKING LOTS

KIEE Security forces were responsible for nighttime staffing of the two close-in parking lots where the majority of VIPs and foreign pavilion staff were expected to park. These lots were staffed by Transportation Services during the daytime. Since the Security forces had not received the Transportation Services training for parking attendants, they interpreted the parking regulations differently. This resulted in some confusion and, at worst, in towing of cars which the Security guard had inappropriately authorized to park in the lot. It should be noted that these were non-revenue lots, so that cash-handling and revenue security were not at issue.

The Security guard stationed in the tour and charter bus terminal was also supposed to monitor several KIEE automobile parking lots near the terminal. In practice, the guard rarely left the vicinity of the terminal and the Fair ticket booths. Since there was a minimal number of incidents in that area, however, it is difficult to assert that a higher level of security staffing was actually necessary.

TOWING SERVICES

KIEE contracted with a towing service to remove illegally parked vehicles from Fair property. The Fair itself owned no tow trucks. Towing orders had to be authorized by the Director of Transportation Services, the Assistant Director, one of three supervisors, or Security to have a vehicle removed from property under the jurisdiction of Transportation Services. In practice, very few cars were towed after the first two months of the Fair, and then only those blocking fire lanes, emergency gates, or other critical locations.

Transportation Services kept a log of the vehicles towed and the person authorizing the tow. The Fair neither paid nor was paid for towing services. The driver paid the towing service directly to release an impounded vehicle. Rates charged for towing were established in the contract between the towing service and KIEE and ranged from $40 for an automobile to $95 for a semi-trailer.

CONCLUSIONS

Better coordination between Transportation Services and Emergency Services at the start of the Fair would have reduced response time for some of the early calls. A plan for emergency response in congested terminals should be decided well in advance of the event. It should include access routes, ways to direct the emergency squad to the victim's exact location, and even such basic matters as who calls for assistance, Emergency Services staff should be trained to locate the site of the incident and follow directions of terminal staff to get there. Terminal staff should be trained in emergency procedures for clearing the area for ambulance or fire truck access. Both pedestrian and vehicle traffic should be stopped while the emergency vehicle is en route.

A clear understanding of territorial boundaries between event security staff, local police departments, and other emergency services and law enforcement agencies should be established well ahead of the event. Coordination procedures should be established and communicated to all staff in both transportation and emergency services.

Where work assignments of two divisions overlap (e.g. Transportation and Emergency Services in Knoxville), each should know the other's relevant procedures and policies. This will avoid misunderstandings and unnecessary visitor complaints.

CHAPTER 13

MARKETING PROGRAM

A number of programs were implemented to market the Fair's parking and transportation systems. This program had been planned to consist largely of brochures, roadway signing, and the AM 530 radio broadcast (see Chapter 4). However, letters and telephone calls started to arrive at KIEE offices nearly one year in advance of opening day requesting specific information on parking, bus service, handicapped provisions, and bus terminal operation. Early responses were by individual letter, then with standard question-and-answer packets. These changed frequently as implementation proceeded. It was not until less than two months before the Fair that arrangements, primarily parking, were firm enough to prepare a quality transportation brochure for widespread distribution. Marketing for bus operations and for visitors arriving at the Fair in their own automobiles were the subject of separate programs. The bus programs were alluded to in Chapter 6 (tour buses).

MARKETING THE BUS SYSTEM

Information about the bus terminal operation and the availability of bus parking space in the designated World's Fair parking lot was disseminated through word-of-mouth to the operators, primarily through the Fair's Tour and Travel and Transportation Services Divisions. There were also contacts with trade associations such as the American Bus Association and a familiarization tour for charter and tour operators held in late March, 1982, which was attended by over 700 representatives of charter and tour operators. An information kit, which included maps of terminal access routes and the terminal layout, reservation request forms, and an information flyer explaining the operation of the reservation system were distributed through the ABA and sent to charter and tour bus operators who purchased group tickets.

Similar information on access routes, terminal layout, and operating procedures were distributed to shuttle bus operators (see Chapter 7).

MARKETING THE PARKING SYSTEM

The primary tool for marketing the Official World's Fair Parking lot system was a brochure entitled "Parking and Transportation at the World's Fair." This brochure, which also gave information on getting to the Fair by public transportation (identifying the major carriers serving the Fair), showed the location of the official parking lots serving the Fair, described the trailblazer signing system, and explained that the

parking charge in official lots was $6.00 and shuttle bus service to the Fair, if required, was included (see Figure 13-1). The brochure was widely distributed through bulk mailings to clubs affiliated with AAA and other auto clubs, distribution through the "Take One" racks of Tennessee State welcome stations, and hand-distribution to hotels and motels in the Knoxville area. A rack distributing service was used to circulate the brochures to a wider area of the southeast. Additional copies were mailed by the Transportation Services Division to individuals who inquired about available facilities.

Usage of the KIEE visitor parking lots near the north gate was below forecasts in May. Several steps were taken to try to increase usage. Signing was increased and larger signs were used, but with little result. When competitors successfully used flagmen to wave in motorists, the operators of KIEE's lots did the same.

KIEE, in conjunction with an on-site concessionaire, even utilized a Laurel and Hardy look-alike comedy team and free beverage coupons to attract business. This joint promotion drew a lot of attention, including newspaper editorials, but failed to significantly increase business.

Access to the largest KIEE lot was changed to be more obvious to passing motorists. It had previously been located to minimize potential traffic congestion, which never materialized. This had a minor positive effect.

Utilization of some lots was increased when an exit ramp from I-40 was opened to all traffic after having been restricted only to buses. However, since this was the second eastbound I-40 exit to Fair parking, the great majority of drivers exited at the first opportunity and there was little diversion from the first ramp. Even an additional freeway sign well in advance of the first exit stating that there were three eastbound exits to parking did not have a significant effect. However, the sign was too wordy and may not have been read very often.

The 530 AM radio station dedicated to Fair traffic and parking conditions broadcast reports of parking spaces available at the north gate. Yet, lots closer to the first exit, but much farther from the gate, filled faster.

In all, motorists appeared to follow the first trailblazer sign they saw. This was true in all approach directions, particularly in the downtown area.

FIGURE 13-1

BY BUS

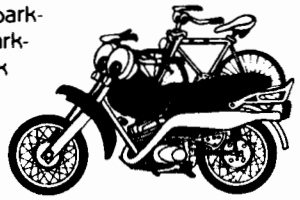
If you prefer not to drive, many bus lines are ready to do the driving for you.

- **These include shuttle buses** from many communities in East Tennessee and surrounding areas, as well as from nearby hotels, motels and campgrounds. Trailways, for example, is providing frequent service from the Smoky Mountain resort towns of Gatlinburg and Pigeon Forge. Call your lodging facility, or the Chamber of Commerce where you'll be staying, for further information.
- **K-Trans, the Knoxville city bus system,** has extended service on its daily routes to cover the Fair's full operating hours. (K-Trans serves over 70% of Knoxville.) For route and schedule information, call (615) 637-3000.

- **For those with limited mobility,** K-Trans also operates a service called "The Lift." Reservations must be made for this service at (615) 522-5000.
- **All buses will pick you up** at the same gate where they dropped you off.

BY BICYCLE OR MOTORCYCLE

Covered and secured parking is available at the Parking Barn on Blackstock Ave., just two blocks from the North Gate for $2.00 per day.

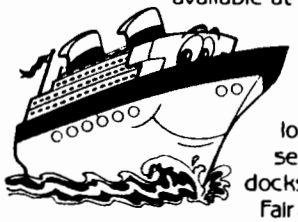


BY AIR

Knoxville's McGhee-Tyson Airport is served by commercial and general aviation. Carriers include Delta, United, USAir, Republic, Eastern and Sunbird Airlines, with Tennessee Airways and Scheduled Skyways providing service within the state. Ground transportation (bus, limousine, taxi service) is available to Knoxville and the World's Fair.

BY BOAT

Docks next to the Fair on the Tennessee River are available at no charge for **dropping off and picking up passengers only.** Nearby commercial facilities are available for longer term docking. Passengers arriving at these docks should purchase their Fair admission tickets beforehand for direct entry to Fairgrounds.



When making your travel plans, keep these official transportation sponsors of The 1982 World's Fair in mind.

Airline -	**Delta Air Lines**
Motor Coach -	**Greyhound Lines, Inc.**
Limousine -	**Carey of Knoxville - Bell Limousine**
Rent-A-Car -	**Avis Rent-A-Car Systems, Inc.**
Automobile -	**Ford Motor Company**
Gasoline -	**Texaco**

THE 1982 WORLD'S FAIR™

MAY-OCTOBER, 1982 KNOXVILLE, TENNESSEE USA

PARKING AND TRANSPORTATION

Including information about:

- Car, motorcycle & bicycle parking.
- City transit & area shuttle buses.
- Airline service.
- Boat docking.
- Plus — map of official parking areas.

HOW TO GET THERE . . .

FIGURE 13-1 (CONT.)

BY CAR

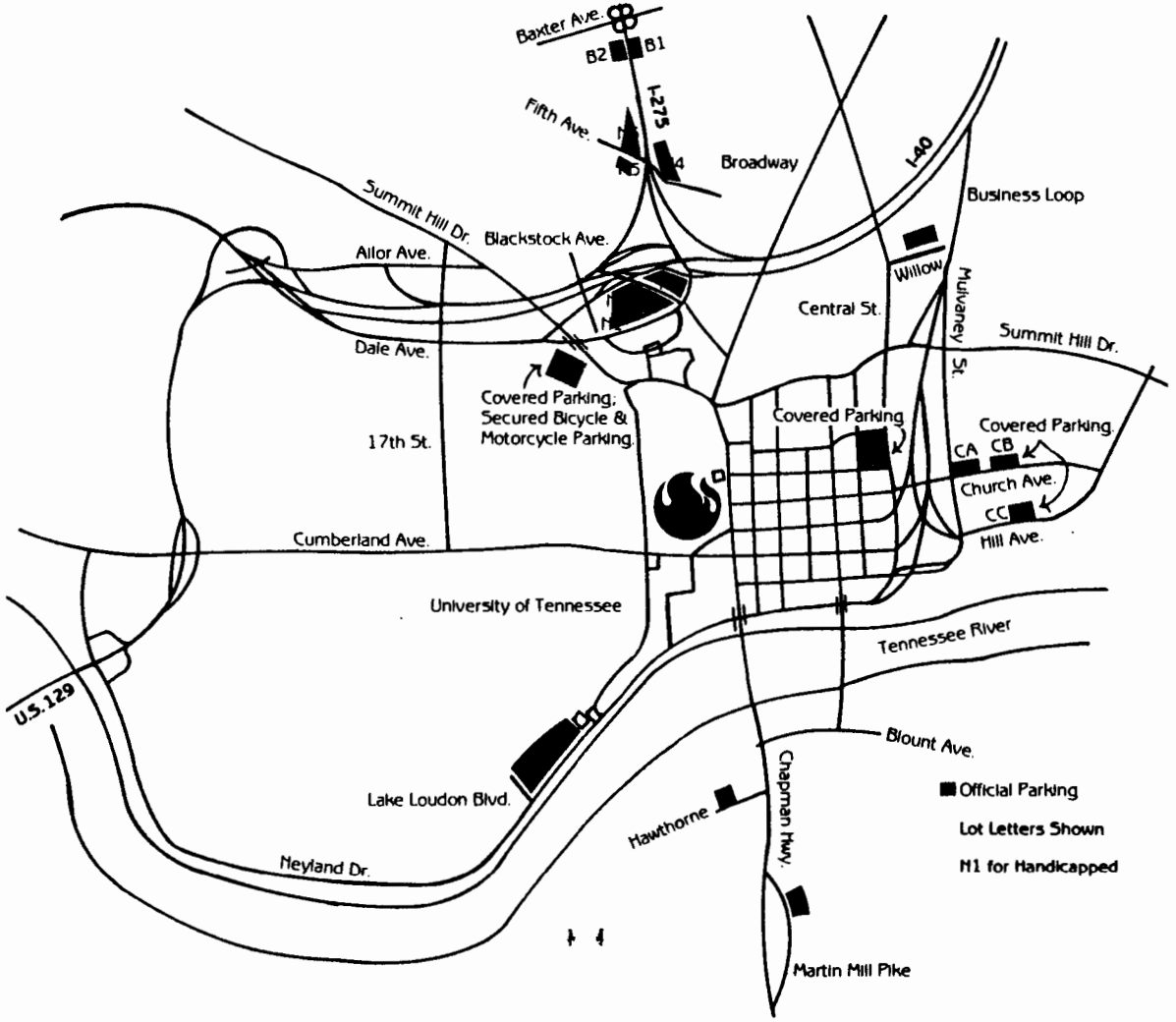
If you drive to the Fair, there are thousands of parking spaces available in official parking lots within a mile of the Fair site.

LOOK FOR SIGNS LIKE THIS.

- **To get to these lots**, shown on the adjacent map, simply follow the "trailblazer" signs on major highways approaching Knoxville. These special signs will direct you to the appropriate freeway exits and any turns you need to make on local streets. All lots are near major highways.
- **The combined parking and transportation fee**, which covers your car and all its occupants, is just $6.00 per day.
- **Some lots are within easy walking distance** of the Fair site. Those more than a half-mile away have frequent shuttle service right up to the Fair's gates.
- **If you park in a shuttle lot**, you will be given a special parking ticket with a shuttle bus stub. When presented to the bus driver, this stub allows your group to ride to the Fair and also gets you a return shuttle bus ticket for each member of your group, at no extra charge. Shuttle rides should take no more than about 10 minutes.
- **To return to your car**, exit through the same gate you entered the Fair and look for the shuttle bus that goes to the lot indicated on your parking stub. When you arrive at the lot, have your stub handy.
- **Smaller RV's may be parked in all lots.** Lots A and S have 7' height restrictions, and vehicles occupying two spaces will be charged $12.00. No hookups are available, and overnight parking is not permitted.

NOTE: OFFICIAL WORLD'S FAIR PARKING LOTS WILL OPEN AT 9 A.M. AND REMAIN OPEN UNTIL ONE HOUR AFTER THE FAIR CLOSES.

MAP



Lot Letter	Location
A	The Parking Barn: Blackstock Ave. below Summit Hill Dr.
B	I-275 At Baxter Ave.
C	Coliseum Garages: Church Ave. Mulvaney & Salvus; Hill Ave. between Mulvaney & Salvus.
H	Hawthorne St. off Chapman Hwy.
M	Martin Mill Rd. off Chapman Hwy.
N	Blackstock Ave. between Dale & Fifth Aves.
S	State Street Garage: State St. between Clinch & Union Sts.
U	Lake Loudon Blvd. between Heyland and Stadium Drs.
W	Willow St. east of Central St.

CONCLUSIONS

To successfully promote a World's Fair, transportation information must be disseminated early and often. During the last half of 1981, the equivalent of one full-time person was kept busy answering general questions from the public regarding transportation services to the Fair. This activity doubled during the three to four months before opening day. Once the Fair opened, the news media and Fair brochures spread enough information that calls decreased to 1981 levels. While some form of printed information is helpful, successful marketing will require personnel to accurately answer transportation related questions.

More specific information should be made available as soon as possible to transportation operators and special groups. It can be revised frequently to reflect updated information.

Specific marketing efforts to increase utilization of KIEE parking lots generally had little impact. Location along primary access routes was the controlling factor in lot selection by Fair visitors. On-lot signing and flagging were the only things that seemed to influence motorists besides pricing. The Phase II report addresses pricing.

Perhaps the single most helpful transportation related marketing tool was trailblazer signing (see Chapter 4). It provided direction to the Fair as well as reminded anyone passing through Central Knoxville of the ongoing Fair. Most of these signs were installed during early April.

CHAPTER 14

TRAVEL PATTERN CHANGES

The downtown Knoxville area contains three primary activities which influence travel patterns to and through the area. These are downtown office space, downtown consumer-oriented businesses, and the University of Tennessee main campus. Travel to and from central Knoxville involves downtown employees who travel predominantly during weekday peak periods, downtown visitors and business patrons who travel mainly during the midday, and University of Tennessee students and staff who travel to and from the University throughout most of each weekday.

In addition to movements to and from the central area, there is also through traffic. The primary through traffic movement is east-west on Interstate 40/75. The other through movements consist of north-south traffic on I-275 connecting with I-40 and traffic between Knoxville and the Smoky Mountains via U.S. 441 (Henley Street).

Traffic to and from the 1982 World's Fair was superimposed upon these travel patterns. Prior to the Fair, traffic was moderately heavy on Henley Street, Cumberland Avenue, Summit Hill Drive west of Henley Street, and the Interstate Highways. Other streets carried relatively low traffic volumes.

IMPACTS OF ROADWAY SYSTEM CHANGES

Roadway system changes were discussed in Chapter 4. These changes primarily fall into four areas: new interstate freeway routes, interstate freeway capacity increases, freeway access changes, and arterial streets.

New Interstate Highway Routes

Upon completion of I-640, the routing of I-75 was changed to utilize I-640 between the I-75/I-640 interchange and the I-640/I-40 west interchange. This was done initially to bypass the I-40 reconstruction area between I-275 and I-640 west. However, it was made permanent to reduce through traffic volumes in the downtown area near the Fair. The decision to reroute I-75 was encouraged by KIEE prior to the I-40 reconstruction and ultimately accepted and approved by TDOT and FHWA. The section of I-75 between I-640 and I-40 was redesignated as I-275 to keep it on the Interstate system. Through traffic volumes decreased on the former I-75 route through downtown. This reduction was estimated to be approximately 17.2 percent.

The KIEE Transportation Services Division also requested the State to modify directional signing to instruct east-west traffic to utilize I-640 rather than I-40. The intent was to cause traffic between Gatlinburg/Asheville and Chattanooga to use I-640 and bypass the vicinity of the Fair. The State did not approve this request because it was considered indirect routing and would have increased vehicle mileage through Knoxville.

Consideration was given to rerouting all trucks moving through Knoxville from I-40 to I-640. Approximately two months before the Fair opened, the City of Knoxville permanently prohibited through truck traffic movements on I-40.

Freeway Access

Prior to the reconstruction of I-40, congestion along I-40 between I-275 and Alcoa Highway was intensive during peak hours and many midday hours as well. The cause of this congestion was the close spacing of interchange ramps plus restricted laneage, resulting in intense weaving movements over short distances. The Interstate improvements eliminated a full interchange at Western Avenue (Summit Hill Drive) and a partial interchange at Gay Street, leaving access to the central area via interchanges at 17th Street, I-275/Oak Avenue (an eastbound temporary ramp at the end of Phase I construction), and the Business Loop. The Western Avenue/Summit Hill Drive access was replaced by a frontage road system consisting of Dale and Ailor Avenues.

Prior to reconstruction of I-40, access to downtown had been heavily concentrated at the I-275 interchange, utilizing Oak Avenue, Broadway, and Henley Street. During reconstruction, this access was closed for a period of about two years except for selected inbound movements at various times. The driving public adjusted by increasing its usage of the Business Loop and Summit Hill Drive (via 17th Street interchange and frontage roads) to reach downtown. Once the Interstate project was completed and the downtown/Oak Avenue exit reopened (only from the west), volumes on Oak and Broadway were lower than before reconstruction because the prior concentration of downtown traffic at one location had been spread over three interchanges. This, in turn, resulted in a reduction in congestion at the intersection of Summit Hill Drive and Henley Street, previously the most congested location in Knoxville.

The Interstate reconstruction also substantially increased access to the area along Dale and Blackstock Avenues in the vicinity of the Fair's north gate. This made it particularly attractive to owners of underutilized land to construct parking lots along these streets.

The temporary Business Loop exit ramp to Hill Avenue on the east side of downtown was opened simultaneously with the World's Fair. Its usage was very low and caused few negligable changes in travel patterns.

Transit Routes

No roadway system changes affected bus route configurations. However, the widening of Henley Street did result in faster bus movement between stops due to improved traffic operations. Since driveway access along Henley Street was reduced as a result of land consolidation for the Fair, K-TRANS was able to improve its bus stop locations and reduce conflicts with adjacent activity.

CHANGES RESULTING FROM THE FAIR

Since traffic congestion was not experienced during the Fair, there was not a pressing need for downtown travelers to find alternate routes or times for their trips. While no formal analyses were made, levels of service generally were observed to be C or better during peak periods and close to A during off-peak periods. Levels of service changed little except on Dale Avenue where large volumes of tour buses occasionally queued far back from the terminal along Blackstock and Dale Avenues during the 9:30 to 11:30 a.m. period on peak Fair days. This resulted from nearly all tour buses arriving about the same time (around 10:00 a.m.). These backups occurred on less than 10 percent of the days--mainly Fridays and Saturdays.

When such queues occurred, they affected mainly out-of-town Fair visitors. These people tended to "follow the crowd" rather than seek out alternate routes. Hence, they caused little shift in routings of Fair visitors. Eventually tour bus operators spaced their arrival times so they spent less time in line waiting to enter the terminal. As one operator said, "If all buses try to arrive at 10:00 a.m. rather than some at 11 or 12, some will still arrive at the Fair at 11 or 12."

Work Schedules

During the ten months prior to the Fair's opening, there was much speculation and fear of intense traffic congestion in downtown and the University of Tennessee area. Several downtown businesses considered revising working hours, and some implemented these changes.

The University of Tennessee had been encouraged by KIEE to revise its class schedule to have all students and staff reach campus by around 9:00 a.m. This would have facilitated student and staff parking on the streets in the Fort Sanders area since most Fair employees and visitors were expected to arrive after 9:30 a.m. The University did not change its schedule, but parking shortages were apparently not serious.

Three to four years before the Fair, the University was also encouraged by KIEE to modify its Spring 1982 and Fall 1982 term dates. It was felt that by completing the Spring term around May 1 and starting the Fall term in October, any traffic, parking, and other conflicts between the University and the Fair could be minimized. The University felt that such a calendar change would be disruptive to its operating schedule. In light of the results, such a change was unnecessary for traffic and parking purposes.

Mode Shift

Walking trips to downtown businesses are almost nonexistent from outside the downtown area. However, parking cost and availability did generate intra-CBD walking trips prior to the Fair. Discussions with downtown employees did reveal some additional intra-CBD walking trips due to the cost of reparking a car in another lot.

Daily parking rates increased by 100% or more during just prior to opening of the Fair. Monthly parking contracts also became more difficult to obtain as did relatively inexpensive daily parking. As a result, more downtown employees rode buses. The Phase II report addresses this in more detail. Fear of a shortage of curb parking in Fort Sanders was the probable cause of increased University of Tennessee staff and students bus utilization. Ridership on some K-TRANS routes increased by up to 70% on a daily basis. Most of the additional ridership was during off-peak periods, although some occurred during peak periods.

Very limited vehicle occupancy data was available for pre-Fair periods. However, it is felt that there may have been a slight increase in vehicle occupancies for downtown and University of Tennessee traffic.

Revised Travel Routes

The presence of the World's Fair along Henley Street may have contributed to continued use of the Business Loop to access downtown from the freeway system. This will be verified by traffic counts analyzed in the Phase II follow-up evaluation.

Few bus routes were modified for the Fair. It had been anticipated that rerouting might be necessary due to congestion resulting from the Fair. Since this did not occur, no regular routes were changed. However, some minor changes were made in World's Fair shuttle bus routes to reduce delays at traffic signals and heavy pedestrian crossings and hours of service were extended on regular routes.

Parking Locations

As mentioned above, downtown parking rates increased during the six months preceding opening of the Fair. In addition, a number of the downtown parking operators became less willing to accommodate monthly employee parking. This caused a shift of employee parking to those facilities offering the lowest daily and monthly parking rates. In general, these were facilities on the opposite side of downtown from the Fair or in the Coliseum area across the Business Loop east of downtown.

Once the Fair began, it became apparent to many downtown parking operators that their lots would not fill without some employee parking. Some operators took on more monthly parking. However, by the end of the Fair it was evident that many lots on the west side of downtown had lost their regular monthly customers to other lots.

It had been expected that Fair visitors might try to occupy short-term metered spaces on downtown streets. Meters were posted with signs indicating that parking meter violations would result in vehicles being towed. Violations were few and, as a result, visitors to downtown had as much short-term meter parking as prior to the Fair.

Many of the downtown businesses complained of reduced business volumes during the Fair, presumably resulting from fears of congestion and crowding. This reduced the need for short-term downtown patron parking during the Fair.

There was no noticeable change in parking patterns of the University of Tennessee staff and students in the Ft. Sanders area. This resulted, at least in part, from most university parking occurring before Fair visitors and employees arrived each morning.

World's Fair employees initially parked in designated lots adjacent to the Fair, with a few employees parking in downtown and Ft. Sanders and several hundred employees parking at a remote lot approximately two miles from the Fair. Employee parking was provided by KIEE to those having monthly permits costing twenty dollars. During the first month, the remote lot accommodated about 400 cars per day. This amounted to about 10 percent of the employees working on site each day. By the

third month of the Fair, less than 100 cars per day were using the remote lot. By that time most employees had found free parking on streets close to the Fair or other locations viewed as more desirable. KIEE also made available about 75 additional employee parking spaces adjacent to the Fair, which were beyond the 250 close-in spaces originally allocated to employees.

The most remote of the nearby employee lots was approximately four blocks from the building where most employees checked in. Despite its availability at a twenty dollar monthly rate, it was the least utilized lot near the Fair site. Employees even stopped using this lot in favor of free parking in the Fort Sanders area and on railroad owned property under I-40 on Blackstock Avenue.

By the fifth month of the Fair, all remote employee parking had been discontinued. The number of close-in employee spaces provided by KIEE had increased to 450, which adequately satisfied employee demand.

CONCLUSIONS

The two major impacts of the Fair on travel habits were increased utilization of K-TRANS and changes in parking locations for employees in downtown. Due to the lack of congestion, routings did not appear to change because of the Fair.

Advancement of Interstate construction, the widening of Henley Street, and the minor traffic engineering improvements made to facilitate traffic flow around downtown and the Fair area all contributed to very efficient traffic flow. Location of major Fair parking facilities away from primary downtown access routes helped avoid operations which could have resulted in traffic congestion.

Impacts on bus operations were not noticeable. This is primarily due to separating major bus and parking activities.

A number of measures could have been taken had problems been more serious. Among these are modified work schedules which would have reduced evening peak hour traffic volumes, greater shifts to transit usage by employees, and continued high parking fees in downtown (they began to drop after the first month of the Fair).

The one area impacted by occasional traffic queuing and congestion was Dale Avenue, a street which had not previously carried high traffic volumes. The location of the bus terminal on an access route without much previous traffic permitted substantial queuing. Had the tour bus terminal been located on a high volume street, severe congestion could have resulted during the 9:30 a.m. to 11:30 a.m. period several times during the Fair. This appears to be a transferable concept for other special events planning.