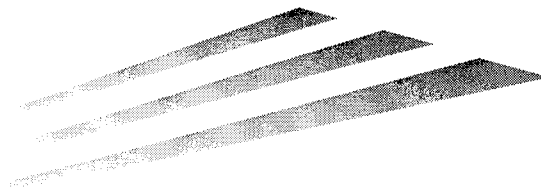




KENTUCKY TRANSPORTATION CENTER

College of Engineering

EVALUATION OF TRIMARC PROCUREMENT PROCEDURES (Interim Report)



UNIVERSITY OF KENTUCKY

REPRODUCED BY:
U.S. Department of Commerce
National Technical Information Service
Springfield, Virginia 22161





UNIVERSITY OF KENTUCKY
COLLEGE OF ENGINEERING

KENTUCKY TRANSPORTATION CENTER

Our Mission

We provide services to the transportation community through research, technology exchange and education. We create and participate in partnerships to promote safe and effective transportation systems.

We Value...

Teamwork -- Listening and Communicating, Along with Courtesy and Respect for Others
Honesty and Ethical Behavior
Delivering the Highest Quality Products and Services
Continuous Improvement in All That We Do

PROTECTED UNDER INTERNATIONAL COPYRIGHT
ALL RIGHTS RESERVED
NATIONAL TECHNICAL INFORMATION SERVICE
U.S. DEPARTMENT OF COMMERCE

For more information or a complete publication list, contact us at:

Kentucky Transportation Center
176 CE/Transportation Building
University of Kentucky
Lexington, KY 40506-0281

TEL: (606) 257-4513

FAX: (606) 257-1815

1-800-432-0719

WORLD WIDE WEB:

<http://www.engr.uky.edu/ktc>

Research Report
KTC-99-49

EVALUATION OF TRIMARC PROCUREMENT PROCEDURES
(Interim Report)

by

Monica L. Osborne
Research Engineer

and

Jerry G. Pigman
Research Engineer

Kentucky Transportation Center
College of Engineering
University of Kentucky
Lexington, Kentucky

in cooperation with

Kentucky Transportation Cabinet
Commonwealth of Kentucky

and

Federal Highway Administration
U.S. Department of Transportation

The contents of this report reflect the views of the authors who are responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the University of Kentucky or the Kentucky Transportation Cabinet. This report does not constitute a standard, specification, or regulation. The inclusion of manufacturer names and trade names is for identification purposes and is not to be considered an endorsement.

June 1999

| | | | |
|--|--|--|---|
| 1. Report No. KTC-99-49 | 2. Government Accession No. | 3. Recipient's Catalog No. | |
| 4. Title and Subtitle Evaluation of TRIMARC Procurement Procedures (Interim Report) | | 5. Report Date June 1999 | 6. Performing Organization Code Federal Aid Research Task No. 93 |
| | | 8. Performing Organization Report No.6 KTC-99-49 | |
| 7. Author(s) Monica L. Osborne and Jerry G. Pigman | | 10. Work Unit No. (TRAIS) | |
| 9. Performing Organization Name and Address Kentucky Transportation Center College of Engineering University of Kentucky Lexington, KY 40506-0281 | | 11. Contract or Grant No. | |
| | | 13. Type of Report and Period Covered Interim | |
| 12. Sponsoring Agency Name and Address Kentucky Transportation Cabinet State Office Building Frankfort, KY 40622 | | 14. Sponsoring Agency Code | |
| | | 15. Supplementary Notes Prepared in cooperation with the Kentucky Transportation Cabinet and the Federal Highway Administration | |
| 16. Abstract An Advanced Traffic Management System (ATMS), referred to as TRIMARC (Traffic Response and Incident Management Assisting the River Cities), was installed in the Louisville, Kentucky and southern Indiana area. A system integrator approach was used for the installation, operation, and maintenance of this system. The system integrator approach involved using Special Experimental Project No. 14 (SEP-14) procedures to procure the services of an equipment installation contractor. The SEP-14 process is an innovative means of procuring projects that may be uncharacteristic to the traditional projects normally encountered by highway departments. SEP-14 provides an opportunity to use and evaluate the contractual arrangements when an alternate process is more beneficial than the traditional processes. In this case, selection of the equipment installation contractor was based on criteria other than cost. The SEP-14 process allowed the equipment installation contract to be based on cost, schedule, and experience/past performance. The objective of this study was to evaluate the effectiveness and success of the TRIMARC project including the SEP-14 process. The overall project has been received positively and the contract is now being extended to include a larger incident management program. The SEP-14 process has proven to provide the system integrator more flexibility with such aspects as receiving the specific equipment desired and contracting with an equipment installation contractor that had previous experience with similar projects. This resulted in time and cost savings to Kentucky and Indiana. | | | |
| 17. Key Words Advanced Traffic Management Systems Special Experiment Project No. 14 (SEP-14) TRIMARC System Integrator Procurement Procedures | | 18. Distribution Statement Unlimited, with approval of the Kentucky Transportation Cabinet | |
| 19. Security Classif. (of this report) Unclassified | 20. Security Classif. (of this page) Unclassified | 21. No. of Pages 30 | 22. Price |

TABLE OF CONTENTS

| | |
|---|-----|
| Executive Summary..... | iii |
| Acknowledgments | v |
| 1.0 Introduction and Background..... | 1 |
| 2.0 Overview of Three Procurement Procedures..... | 2 |
| 2.1 Traditional Low-Bid Procurement of Contractor Services..... | 2 |
| 2.2 System Manager Procedure | 2 |
| 2.3 System Integrator Procedure | 2 |
| 3.0 Special Experimental Project No. 14..... | 3 |
| 3.1 SEP-14 Application to TRIMARC Project | 3 |
| 4.0 TRIMARC Contractual Arrangements..... | 4 |
| 4.1 Unsolicited Proposal by TRW | 4 |
| 4.2 The Professional Services Contracting Process by KYTC to Select System Integrator | 4 |
| 4.3 SEP-14 Process to Select Equipment Installation Contractor | 4 |
| 4.3.1 Description of TRW Procedure for Selecting TRIMARC Equipment Installation Contractor..... | 5 |
| 4.3.2 Advantages and Disadvantages of the System Integrator Process .. | 6 |
| 5.0 Description of Spartan Construction Company Contract for Equipment Installation | 8 |
| 5.1 Tasks and Phases Required for Spartan Construction Company..... | 8 |
| 5.2 Contract Costs and Schedule | 8 |
| 6.0 Assessment of Impact of Contract Arrangements on Spartan Construction Company’s Ability to Accomplish Objectives | 9 |
| 7.0 Funding and Payments..... | 9 |
| 8.0 Overall Assessment of System Integrator and SEP-14 Process as Applied to TRIMARC..... | 10 |
| 9.0 References | 11 |
| 10.0 Figure 1 – TRIMARC Map | 13 |
| 11.0 Appendix A..... | 15 |

EXECUTIVE SUMMARY

Innovative practices in construction contracting techniques have become more frequent and necessary in recent years. These practices benefit the transportation industry by experimenting with methods different from the traditional methods. This allows for growth and the adoption of procedures that provide higher quality and a better benefit to cost ratio.

An Advanced Traffic Management System (ATMS), referred to as TRIMARC (Traffic Response and Incident Management Assisting the River Cities), was installed in the Louisville, Kentucky and southern Indiana area. A system integrator approach was used for the installation, operation, and maintenance of this system. Special Experimental Project No. 14 (SEP-14) procedures were used to procure the services of the equipment installation contractor. An evaluation was conducted to determine the effectiveness of the process approved for this procurement. This evaluation was accomplished by review of documentation related to the TRIMARC project including contracts, memorandums, and proposals. Also, input was received from the principal participants in the project including representatives of the Kentucky Transportation Cabinet, HNTB, Spartan Construction Company, and TRW, Inc.

The SEP-14 process is an innovative means of procuring projects that may be uncharacteristic to the traditional projects normally encountered by highway departments. SEP-14 provides states an opportunity to use and evaluate the contractual arrangements when an alternate process is more beneficial than the traditional processes. After some time period, this alternate process may be evaluated by the Federal Highway Administration to determine if it should be classified operational instead of experimental.

The evaluation on the TRIMARC project's use of the system integrator and SEP-14 bidding practices has been very positive. The project has encountered some delays; however, it is progressing in a manner that is satisfactory to all parties involved. The overall project has been received positively and the contract is now being extended to include a larger area for the incident management program. The SEP-14 process has provided the system integrator more flexibility and has allowed the procurement of the equipment and services to be based on criteria other than cost. This has allowed the system integrator to receive the specific equipment desired and to contract for the equipment installation from a contractor that had previous experience with similar projects resulting in time and cost savings to Kentucky and Indiana.

ACKNOWLEDGMENTS

An expression of appreciation is extended to the following participants in the project for their input and review.

John Crossfield, Kentucky Transportation Cabinet
Leon Walden, Kentucky Transportation Cabinet
Nancy Albright, Kentucky Transportation Cabinet
Steve Williams, Kentucky Transportation Cabinet
Barney Leslie, TRW, Inc.
John Nevin, TRW, Inc.
Richard Sutherland, HNTB
Bobbie Giles, HNTB
Doug Brossart, Spartan Construction Company
Terry Metcalf, Bluegrass Electric

1.0 INTRODUCTION AND BACKGROUND

Traffic congestion continues to be a major concern in metropolitan areas. Incidents, such as traffic crashes or disabled vehicles, can disrupt traffic flow causing major delays for motorists. Costs of more than \$16 billion and more than 2 billion hours annually are the effects of such delays for motorists (1). Therefore, the need for effective Advanced Traffic Management System (ATMS) programs is growing. ATMS programs include preplanned and coordinated incident management procedures to detect and remove incidents and restore roadway capacity as quickly and safely as possible. ATMS programs include an array of strategies to improve incident detection and verification, response time, site management, clearance time, and motorist information.

In 1994, a study by HNTB in association with Presnell Associates Inc. provided short and long range recommendations for an ATMS in metropolitan Louisville, Kentucky. The study included a concept plan for a freeway incident management plan to serve I-65 from Fern Valley Road in Kentucky to State Route 311 in Indiana. This section includes the Kennedy Bridge, a six-lane structure that is one of only three that link Louisville to Southern Indiana. Also included in this study was a section of I-264 (Watterson Expressway). This area is depicted in Figure 1, which is attached at the end of the text.

The Kentucky Transportation Cabinet (KYTC) in conjunction with the Indiana Department of Transportation (INDOT) used the HNTB study as a guide to develop a proposal for the design of an ATMS program. The program is referred to as TRIMARC (Traffic Response and Incident Management Assisting the River Cities). In September 1995, a contract was signed with TRW, Inc. for the design of the ATMS program. In September 1996, before the design of the ATMS was completed, TRW submitted an unsolicited proposal to privatize the installation and operation of the project. The KYTC does not have procedures for accepting unsolicited proposals; therefore, in March 1997, a Request for Proposal (RFP) was issued. TRW was the only responder and was awarded a contract for the integration, installation, operation, and maintenance of the TRIMARC project. Under this contract, TRW was to procure all equipment and services in compliance with federal regulations. TRW used the process submitted by KYTC and approved by FHWA under Special Experimental Project No. 14 (SEP-14) to procure a contractor for equipment and its installation. The Federal Highway Administration Special Experimental Project No. 14 (SEP-14) is used for any construction contracting techniques which deviate from the competitive bidding provisions in the United States Code Title 23 Section 112. In April 1998, Spartan Construction Company was awarded the contract based on a point-award system for cost, schedule, and past performance/experience.

2.0 OVERVIEW OF THREE PROCUREMENT PROCEDURES

There are a number of options to contract for services necessary to develop and implement Intelligent Transportation System (ITS) projects. Construction projects could involve traditional planning, design, and maintenance phases in their development. Non-traditional types of contracts that have been successfully utilized to develop and implement ITS projects include retaining a system integrator and/or a system manager.

2.1 Traditional Low-Bid Procurement of Contractor Services

The traditional procurement procedures for construction performed by the state highway department or construction under its supervision follow United States Code Title 23 Section 112 "Letting of Contracts" (2). In these cases, a request for submission of bids is made by advertisement unless the FHWA approves some other method of procurement. Contracts for the construction of each project are awarded only on the basis of the lowest responsive bid submitted by a bidder that meets the established criteria of responsibility.

Contracts for program management, construction management, feasibility studies, preliminary engineering, design, engineering, surveying, mapping, or architectural related services are negotiated under Title IX of the Federal Property and Administrative Services Act of 1949 or equivalent state qualifications-based requirements (3).

2.2 System Manager Procedure

The system manager is retained to work on behalf of and in coordination with the agency involved in the ITS project. This type of contract typically provides professional staff with special skills, experience and resources that a state may not have to successfully facilitate the completion of a particular ITS project. The system manager would then work directly with contractors on different contracts to complete the development or implementation of the ITS project. The system manager does not, however, exercise control over the type of equipment being used. This can create problems. The system manager is ultimately responsible for the project even though there are limitations in the selection and operational characteristics of equipment being used.

2.3 System Integrator Procedure

The system integrator procedure is similar to the system manager procedure except the system integrator has been granted the authority to procure both services and equipment. The responsibility of a system integrator typically involves integration of software with the monitoring and control equipment required for a system. The software includes the development of all central facility software. The central facility software also requires the selection, procurement, configuration, and installation of all hardware needed to provide the functionality of whatever system is being implemented. The

integrator is usually required to test the central computer system and related field hardware to provide the required functionality. This is to ensure that the software, monitoring and control equipment development work is coordinated with related work that other contractors may be performing. The system integrator is also responsible for advertising, evaluating, and recommending contractors for particular aspects of the project. If the system integrator concept involves the procurement of an ITS system that meets the definition of construction, the SEP-14 process must be followed if federal funds are used to obtain approval of the procurement method specified for the project.

3.0 SPECIAL EXPERIMENTAL PROJECT NO. 14

The Federal Highway Administration Special Experimental Project No. 14 (SEP-14) is used for any construction contracting techniques which deviate from the competitive bidding provisions in the United States Code Title 23 Section 112. Any federally funded construction contract that utilizes a method of award other than the lowest responsive bid is to be evaluated under SEP-14. These non-traditional contracting techniques may include best value, life cycle cost bidding, qualifications based bidding, and other methods where cost and other factors are considered in the award process. While the FHWA has not defined the weighting criteria for cost in a state's award procedures, a state must utilize cost as one of the award criteria in order to have a competitive process under SEP-14.

The purpose of SEP-14 is to evaluate "project specific" innovative contracting practices that have the potential to reduce the life cycle cost of projects while at the same time maintaining product quality. The most common "project specific" innovative contracting techniques include cost-plus-time bidding, lane rental, design-build contracting, and warranty clauses. However, there have been several other SEP-14 approvals such as life cycle cost procurement, lump sum bidding, indefinite quantity/indefinite delivery, alternate pavement type bidding, no excuses bonuses, price/qualifications-base bidding, constructability reviews, and system integrator contracts.

3.1 SEP-14 Application to TRIMARC Project

On January 28, 1998, the FHWA approved the proposal by the KYTC to use the system integrator contracting procedure on the TRIMARC ATMS project. A copy of the documentation describing contracting procedures using the SEP-14 process is attached as Appendix A. TRW, as the system integrator, was responsible for construction management, project supervision, and system integration. The contract between the KYTC and TRW included the provision for TRW to contract for equipment and its installation utilizing evaluation factors in addition to cost. This type of contracting is permitted under the SEP-14 process. The SEP-14 application allows for the contract to be awarded on the basis of "best value" rather than the traditional low-bid. The bidding process was based on a point system for cost, schedule, and past experience/performance.

4.0 TRIMARC CONTRACTUAL ARRANGEMENTS

4.1 Unsolicited Proposal by TRW

The KYTC contracted with TRW to perform the design of the ATMS for the TRIMARC project. Before the design of the ATMS was completed, TRW submitted an unsolicited proposal to privatize the installation and operation of the project. The KYTC does not have procedures for accepting unsolicited proposals; therefore, the unsolicited proposal was not accepted.

4.2 The Professional Services Contracting Process by KYTC to Select System Integrator

After rejecting the unsolicited proposal, the KYTC issued a RFP for the TRIMARC project to provide system integration for the ATMS system in metropolitan Louisville. The only respondent to the RFP was TRW. A 10-year contract was signed between TRW and KYTC for the freeway incident management services. A renewal option is available at the completion of the 10 years.

4.3 SEP-14 Process to Select Equipment Installation Contractor

TRW solicited bid proposals for the installation of TRIMARC equipment from KYTC and INDOT pre-qualified contractors using the approved SEP-14 process. There was a Source Selection Committee comprised of TRW members that led the selection of the equipment contractor. There was also a Bidding/Oversight Selection Committee comprised of KYTC, Kentucky Transportation Center, and FHWA members that were present at the bid opening. The deadline for the proposals was March 18, 1998 and no bids were received after the deadline. All proposals were evaluated for responsiveness to the bid instructions and technical compliance and deficiencies were noted. The Source Selection Committee evaluated the pricing submitted by the bidder for correctness of extended price and total price relevant to the engineer's estimate. They evaluated the experience and past performance by the bidders to ascertain their respective level of relevant experience. They also reviewed submitted proposed schedules for reasonableness and impact on construction inspection and engineering. After the first round of evaluation, deficiency reports and clarification requests were issued to each bidder as necessary. The bidders then submitted their "best and final" offer to TRW. The Source Selection Committee reported their scoring and recommendations on April 2, 1998 to the Bidding/Oversight Selection Committee. The contract award was on April 3, 1998.

The procurement schedule of events consisted of the following:

| | |
|-------------------------------------|-------------------|
| Mandatory Bidders Conference | February 23, 1998 |
| Initial Submittal | March 18, 1998 |
| TRW Bid Analysis | March 18-24, 1998 |
| Request for Best and Final Proposal | March 25, 1998 |
| Proposal Due | April 1, 1998 |
| Announcement of Apparent Winner | April 3, 1998 |

4.3.1 Description of TRW Procedure for Selecting TRIMARC Equipment Installation Contractor

Twenty-four companies attended the bidder's conference. Only three of the twenty-four companies submitted a proposal bid. These companies included Spartan Construction, Apex Contracting, and TransTech. The proposals were rated on a point system for cost, schedule, and experience/past performance. The cost and schedule areas were rated relevant to the engineer's estimate.

Cost was scored in the following manner: All bidders started with 100 points. Bids that exceeded the engineer's estimate were decremented by one point for each \$20,000 increment by which their bid was higher. Bids that were less than the engineer's estimate were incremented one point for each \$20,000 (or part of \$20,000) increment by which their bid was lower.

Schedule was scored in the following manner: All bidders started with 30 points. Bidders whose schedules exceeded the engineer's schedule were decremented one point for every week increment by which they exceeded. Bidder's schedules which were projected to be completed sooner than the engineer's schedule were incremented one point for every week increment prior to the engineer's schedule completion.

Experience and past performance were scored in the following manner: for experience, the bidders were ranked on their demonstrated work on similar ITS roadway projects within the last five years. The bidder with the most experience was ranked first and received 10 points. The next most experienced bidder received nine points, and so on. If in the judgement of the evaluators, there were no discernible differences in experience levels of more than one bidder, the same number of points were awarded to each of the tying bidders. The next ranked bidder received only one less point. Past performance was scored in the same manner as experience. Each bidder's past performance was evaluated on the ability to perform on schedule, on budget, and on the ability to work with its customers on similar type projects within the last five years.

The points for each area for the three companies involved in the bidding process are listed in Table 1. All three companies were equal in related experience and schedule. Spartan and TransTech were equal in past performance; however, Apex had fewer points in this category. In the cost category, Spartan proposed a lower cost than the other

companies followed by TransTech and Apex, respectively. When the companies were asked to submit their “best and final” bids, Apex Consulting withdrew their bid proposal citing DBE content and scheduling problems. Spartan Construction and TransTech were identical in all areas except cost. Spartan Construction had the lower cost, therefore, receiving more points. Spartan was awarded the contract based on these results on April 3, 1998.

| Scoring Summary | | | |
|------------------------|-------------|----------------|------------------|
| Category | Apex | Spartan | TransTech |
| Past Performance | 9 | 10 | 10 |
| Related Experience | 10 | 10 | 10 |
| Schedule | 30 | 30 | 30 |
| Cost | 60 | 130 | 115 |
| TOTAL | 109 | 180 | 165 |

Table 1. Equipment Contractor Scoring Summary

4.3.2 Advantages and Disadvantages of the System Integrator Process

The FHWA has expressed the intent to encourage the use and evaluation of all promising innovative contracting practices by state highway agencies and others that fall within the flexibility of the Federal-aid program requirements. The success of practices evaluated under SEP-14 requires the cooperation, support, and commitment of all those involved. The FHWA has noted that with the support of the entire industry, this initiative to promote innovative contracting practices can foster positive changes to our traditional ways of doing business and result in worthwhile improvements that will benefit the nation’s highway users.

There are several advantages to the system integrator process for awarding contracts. These include the following:

- The contract award is based on criteria, other than low bid, which generally results in better quality work and more experienced contractors for a project.
- This type of bidding assures that the contractor is capable of providing the services that are expected for a project.
- On this project, there was a two-bid process that allowed the bidder to correct a bid due to pricing errors and resubmit without being assessed a penalty or having to withdraw. For a traditional Federal-aid bidding process, the contracting agencies would not receive a final bid quantity list until 30 days after the contract was awarded. If the equipment does not meet the agency's standards there could be a delay in the project in order to get other equipment.
- The KYTC SEP-14 approval allowed the system integrator to approve the equipment and identify technical non-compliance for all the bidders before the contract was awarded. This process gave the agencies the best quality and cost-effective product.
- The system integrator approach allowed project approvals to be made sooner since only one entity was involved. This reduced the length of delays considerably.

There were also a few noted disadvantages to the system integrator process that may need to be addressed in future contracts of this type. These include the following:

- Under KYTC's professional service procurement requirements, profit may only be taken on a consultant's labor costs. Normally, ITS projects require a consortium of consultants to provide the needed specialized skills including project management, software engineers, electrical engineers, civil engineers, and many others. There is also the need to meet DBE/MBE participation goals. While there is a single point of responsibility, profit on the overall value of the work is not allowed. The result is responsibility for large contracts but with the ability to only claim a small percentage of the total amount as labor profit. The current procedure for assessing profit fees does not appear to take into consideration the risks assumed by consultants in managing this type of contract. Additional research and evaluation may be needed to develop a profit model that is fair to all parties involved. It should be based on the size, complexity, and risks associated with the project and not just the labor content.
- The procurement procedure used for the equipment installation contract also needs to be addressed. The subjectivity associated with the evaluation of Past Performance and Related Experience is a weakness. More objective means of

scoring these categories should be developed with more input from the Oversight Committee and/or Evaluation Team.

- The method of scoring the cost should be reviewed and consideration given to awarding partial points for partial increments of \$20,000. The bidder's score was increased or decreased one point for each \$20,000 increment by which their bid was higher or lower than the engineer's estimate. For example, a bid \$1,000 lower or \$20,000 lower than the engineer's estimate would be awarded one additional point. Likewise, a bid that was \$1,000 higher or \$20,000 higher than the engineer's estimate would lose one point.

5.0 DESCRIPTION OF SPARTAN CONSTRUCTION COMPANY CONTRACT FOR EQUIPMENT INSTALLATION

5.1 Tasks and Phases Required for Spartan Construction Company

Spartan Construction Company was awarded the contract for equipment installation for the TRIMARC project. This contract consisted of furnishing and installing the ITS traffic control equipment including variable message signs, closed circuit video equipment, radar vehicle detectors, traffic control cabinets, traffic controllers, loop detectors, piezoelectric detectors, and equipment panels. In addition, Spartan was also required to test the equipment and provide equipment software documentation and training. All tasks for the initial contract have been completed.

5.2 Contract Costs and Schedule

TRW supplied an engineer's estimate for the schedule and cost of the proposed bid. Spartan kept the engineer's schedule as the proposed work schedule but proposed a lower cost. The schedule was to begin on the contract award date and be completed in early November 1998. The contract cost was approximately \$5.46 million.

Spartan encountered several delays in the project; however, based on discussions with Spartan, TRW, and KYTC, the problems were beyond the control of Spartan. Weather delayed the project for three weeks during the summer of 1998. There was also a problem with the pole provider not having a compliant product. The pole provider originally committed to providing a pole that met the desired specifications; however, the actual pole did not meet these standards. This caused a delay of 10 weeks because no foundation work could be performed without the proper bolts for the selected poles.

The variable message signs (VMS) were not subject to the initial schedule because the trusses could not be designed until the VMS geometry (dimensions, weight, door and vent locations, etc.) was known. All original bidders on TRIMARC were to provide the truss at cost plus a percent profit that was declared in the bid process and evaluated uniformly by TRW using an estimated price. A firm fixed unit price was used

for the installation costs of the structure. Once the geometry was known, a competitive bid process was sought through Spartan. The low bidder with the best schedule was chosen to fabricate the trusses. This delay projected the schedule into 1999.

6.0 ASSESSMENT OF IMPACT OF CONTRACT ARRANGEMENTS ON SPARTAN CONSTRUCTION COMPANY'S ABILITY TO ACCOMPLISH OBJECTIVES

Spartan's contractual agreement with TRW appeared to be successful in all aspects of the project. There were delays in the project but those were documented to have been beyond the control of Spartan. Spartan's work was of good quality and a team relationship appears to have been built between TRW and Spartan. The tasks were completed with ease due to the arrangement of the system integrator approach. Necessary approvals for Spartan were quick since only one approval from TRW was needed. Weekly meetings were held between the participating parties in order to address situations before they became major problems/delays. All the parties contributed to the project by using their past experience and knowledge, eliminating problems that had already been encountered on other similar projects. This team approach and cooperative process has helped to ensure a successful project.

7.0 FUNDING AND PAYMENTS

The TRIMARC project is funded with federal CMAQ (Congestion Management of Air Quality) funds. Both Kentucky and Indiana share the cost. The initial payments for the integration and installation are from a master lease arrangement through GE Capital Public Finance, Inc. (GECPPF). The lease payments are funded through CMAQ. The maintenance and operations are funded through CMAQ. The benefits of utilizing the master lease program of GECPPF are speed and simplicity. This type of financing is an innovative process that reduces delays due to slow cash flow or limited funding and also speeds up the project development.

Bookkeeping of payments is completed through the Kentucky Construction and Engineers Management Program Version II (KYCEMPIO). This program allows contractors to enter bid items, prices, and other relevant information into their computer for completed phases of the project. The program then totals the amounts and produces a contract payment form to be submitted to TRW for verification and forwarded on to KYTC for payment. The result has been a smooth payment process that appears to have been agreeable to TRW, Spartan, and other equipment subcontractors.

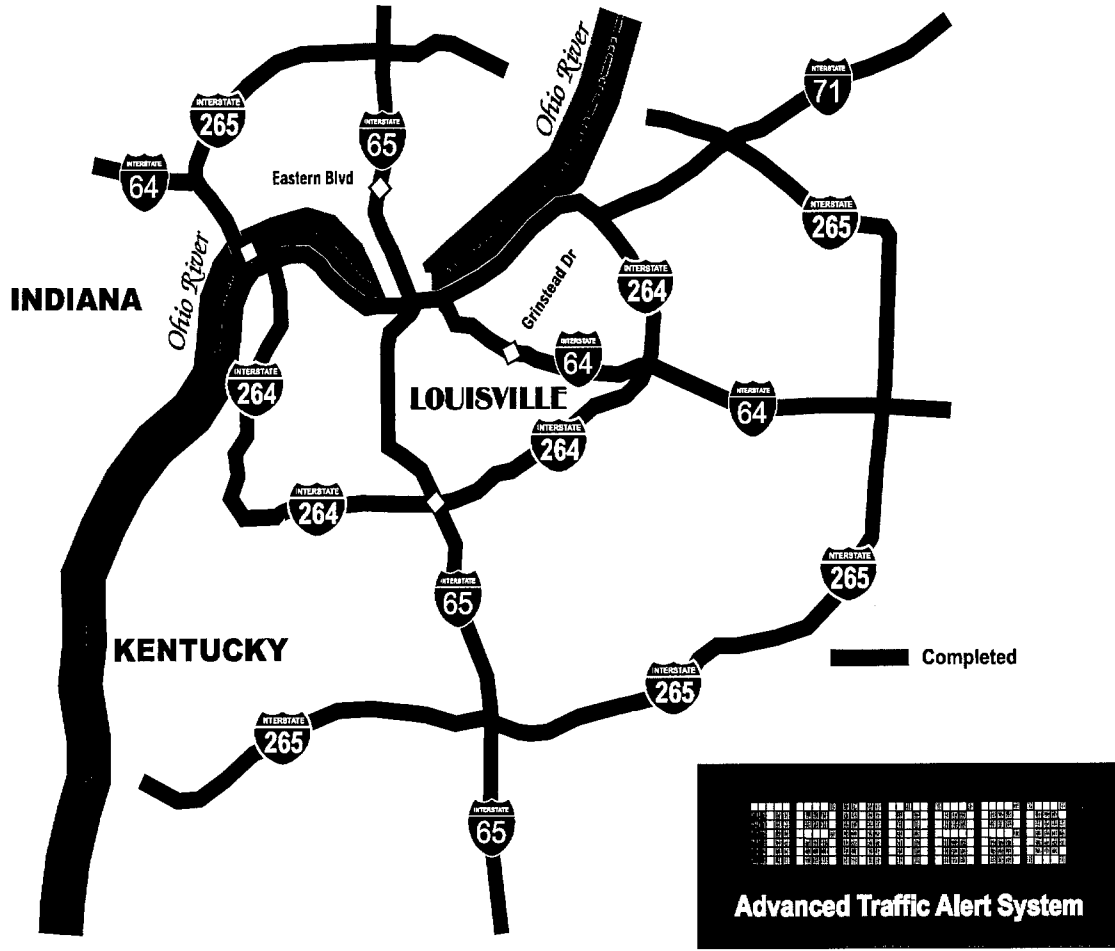
8.0 OVERALL ASSESSMENT OF THE SYSTEM INTEGRATOR PROCESS AS APPLIED TO TRIMARC

TRIMARC is nearing the completion of the integration and installation tasks of the initial phase of the incident management project. The contract method allowed TRW to obtain an equipment installer based on the quality of work and related experience instead of just a low bid proposal. The result was a reduction in the amount of possible delays since the contractor had to demonstrate experience relevant to this type of innovative work. The previous experience of the contractor, who was also the equipment installation contractor for the ARTIMIS (Advanced Regional Traffic Interactive Management and Information System) project in Cincinnati and northern Kentucky, was utilized to reduce costs and lend practical ideas to the project based on past experience. To date, the cost of the project has not exceeded the engineer's estimate. The weekly meetings promoted team involvement and reduced conflicts and liquidated damages because the lines of communication were open. Due in part to the good relationship of the parties involved, the contract is being extended to include a larger traffic area around Louisville.

9.0 References

1. HNTB and Presnell Associates Inc. *I-65 Freeway Incident Management Study*. June 1994.
2. "Letting of Contracts." Title 23 *United States Code* Section 112. N.d. Online. Cornell Law. Available: <http://www4.law.cornell.edu/uscode/23/112.html>. 26 Jan. 1998.
3. United States. Cong. House. *Federal Property and Administrative Services Act of 1949*. Title IX Federal Government Selection of Architects and Engineers. Public Law 92-582. 92nd Cong., H.R. 12807. 27 Oct. 1972. Online. Available: <http://acec.org/programs/brooks.html>.

10.0 Figure 1. Area Included in TRIMARC Project



Preceding Page Blank

11.0 APPENDIX A

Preceding Page Blank

TRAFFIC RESPONSE AND INCIDENT MANAGEMENT ASSISTING
THE RIVER CITIES (TRIMARC)

SYSTEM INTEGRATION CONTRACTING PROCEDURES
SPECIAL EXPERIMENTAL PROJECT NO. 14

TRIMARC began in 1992 when FHWA awarded the Kentucky Transportation Cabinet (KYTC) \$250,000 in ITS Funds for an Early Deployment Study to develop an incident management program for I-65 in Louisville and Southern Indiana. The study was completed in 1994. In April of 1996, a design contract was signed with TRW, Inc. This work is complete and an installation procurement package is essentially ready to request bids. Shortly after design was initiated, TRW submitted an unsolicited proposal to privatize the installation and operation of the project. The KYTC does not have procedures for accepting unsolicited proposals and a RFP was issued. TRW was the only responder and signing of an Agreement which includes the provision for TRW to contract for equipment installation is imminent.

TRIMARC currently is an ATMS project. It could eventually be expanded to add ATIS service.

A FHWA memorandum, dated May 1, 1997, from Messrs. Ptak and Judycki, subject: "Procurement Information for ITS Projects" has an attachment which discusses various types of ITS-type implementation approaches which must be approved utilizing the SEP-14 process. One such approach is the System Integrator method.

The KYTC has implemented two major ITS-type projects where the term "System Integrator" was used but the approach was more like a System Manager. Several lessons have been learned from these projects. Those which relate to the proposed implementation approach for TRIMARC are:

- Traditional low-bid procurement is not appropriate for most ITS-type projects. ADVANTAGE I-75 used an approach similar to South Carolina's "Highest Composite Score". The ARTIMIS project in Cincinnati/Northern Kentucky was basically a System's Manager approach coordinating the work of four low-bid contractors. While both approaches worked better than traditional methods, both led to conflicts, delays, extra work and claims
- There cannot be a "system integrator" unless there is control over equipment.
- It is extremely desirable to reduce the potential for conflicts and "finger-pointing" ARIMIS had three independent, low-bid, contractors working at the same time. Each contractor did work to fit their own schedule and there has been extensive finger-pointing, claims, counter-claims and delays.
- The KYTC does not have the expertise for system integration to be performed "in-house".
- Projects like TRIMARC need flexibility in procurement procedures.

Reciprocity procurements wherein the selected vendor agrees to purchase goods and/or services from the procuring entity should not be allowed. An ARTIMIS contractor purchased equipment from a vendor under a reciprocity agreement that had many problems and required undue integration and testing efforts.

As a result of the above lessons learned and in the interest of accelerating the TRIMARC project, the KYTC proposes to modify the equipment procurement process. Specifics follow:

TRW will solicit proposals for the roadway installation of TRIMARC equipment from KYTC and INDOT pre-qualified contractors. A detailed bid package has been prepared for KYTC by TRW under a separate contract. The bid package includes general and special terms and conditions; evaluation criteria; detailed specifications for the electronics (e.g. variable message signs, cameras, detectors, etc.); plan sheets detailing the installation requirements (e.g. foundations, locations, wiring diagrams, etc.) and a price sheet with the elements of the bid and the estimated quantities. All bidders will be required to submit (1) their unit prices and extended price for each line item, (2) a project schedule which shows any differences from the master project schedule, (3) Related experience and past performance data and (4) data sheets for all electronic components and lowering system poles.

The following process will be followed:

1. All bids will be received by TRW by ____ a.m. EST on January __, 1998. Any bids received after the deadline will be returned to the bidder unopened.
2. Bids will be opened in confidence by TRW and the total bid prices will be known only by the TRW Source Selection Committee and representatives of KYTC, INDOT, and FHWA. The Source Selection Committee will consist of the TRIMARC Project Engineer, a TRW contracts representative, and the TRW Director of Transportation. Additional technical assistance in evaluating and scoring the proposals may be solicited from the project team. The KYTC, INDOT and FHWA Bidding/Oversight Committee (described later) will be present and monitor all actions of the TRW Source Selection Committee.
3. All proposals will be evaluated for responsiveness to the bid instructions and technical compliance. This will involve comparing the data sheets provided with the bid specifications. Failure to comply or failure to demonstrate compliance to a specification will be considered a "deficiency". In areas where there is uncertainty in compliance or a conflict in the proposed items specifications, a "clarification" request will be generated.
4. TRW will evaluate the pricing submitted by the bidder for correctness (extended price and total price). TRW will follow the Kentucky requirement that unit pricing prevails. TRW will conduct an analysis of the pricing for reasonableness. If there are cases where a unit price for an item is significantly out of line with the Engineer's estimate, a "clarification" request will be generated.

5. TRW will evaluate the experience and past performance provided by the bidders to ascertain their respective level of relevant experience, i.e. have they (or their team) installed variable message signs, cameras, detectors, highway advisory radios, etc. TRW will also contact a minimum of two references to establish past performance scoring. The Bidder's ability to meet schedule and remain in budget are key elements of this evaluation. Safety, liquidated damages, maintenance of traffic plans, and cooperation are additional elements to be factored in the scoring.
6. TRW will review submitted proposed schedules for reasonableness and impact on construction inspection and engineering. Longer schedules will impact the overall cost to the States by requiring additional inspection. Likewise, abbreviated schedules may reflect a bidder's lack of understanding of what is required. Questions arising from this analysis will result in requests for "clarifications".
7. After this first round of evaluation (steps 2 through 6), deficiency reports and clarification requests will simultaneously be issued to each bidder as necessary. The bidders will have 7 days to submit a "best and final" offer to TRW.
8. TRW will review the best and final offers and any offer that is still non-responsive will be rejected.
9. All compliant bids will now be scored in the following three areas listed in their order of importance:
 - A. **COST:** Cost will be scored in the following manner: All bidders start with 100 points. Bids that exceed the Engineer's Estimate will be decremented 1 point for each \$20,000 increment by which their bid is higher. Bids that are less than the Engineer's Estimate will be incremented 1 point for each \$20,000 (or part of \$20,000) increment by which their bid is lower. For example, a bid \$2,000 lower than the Engineer's Estimate would be awarded 1 additional point for a total of 101. A bidder whose proposal is \$15,000 greater than the Engineer's Estimate would have a point deducted for a total of 99. A bidder whose price is \$61,000 higher would have 4 points deducted.
 - B. **SCHEDULE:** Schedules (excluding VMS work) will be scored in the following manner: All bidders start with 30 points. Bidders whose schedules exceed the Engineer's Schedule will be decremented 1 point for every week increment by which they exceed. Bidder schedules that are projected to be completed sooner than the Engineer's Schedule will be incremented 1 point for every week increment prior to the Engineer's Schedule completion.
 - C. **EXPERIENCE/PAST PERFORMANCE (from Step 5):** This evaluation area will be scored in the following manner: For experience, the bidders will be ranked on their demonstrated work on similar ITS roadway project within the last five years. The bidder with the most experience will be ranked first and receive 10 points. The next most experienced bidder will 9 points, the next 8 points, and so on. If in the judgment of the evaluators, there is no discernible difference in

experience levels of more than one bidder, the same number of points will be awarded to each of the tying bidders. The next ranked bidder would receive only 1 less point. For example, if three bidders tied for the most experience, each would be awarded 10 points. The next most experienced bidder, fourth overall, would receive 9 points. Past performance will be scored much in the same manner as experience. Each bidders past performance will be evaluated on ability to perform on schedule, on budget, and ability to work with its customers on similar type projects within the last 5 years. The bidders will be ranked where the highest ranked (best past performance) will receive 10 points, the next 9 points, and so on. Ties will receive the same points and the next ranked bidder, 1 less point. Points will be totaled from the scoring process and the high point bidder will be the apparent winner that will be recommended to enter final negotiations with TRW for the work.

10. The Source Selection Committee will review the scoring and issue a Source Selection Report documenting the results from the bid analysis and the proposed prices from all bidders. This Report will be provided to KYTC, INDOT, and FHWA with TRW's recommendation. Upon notification from KYTC, TRW will finalize negotiations and issue a subcontract to the winning bidder to perform the installation of the system.

Bidding/Contracting Oversight - An oversight committee will be established to assist TRW with bidding, contract award and management. This Committee will be composed of the following persons or their representatives:

- Nancy Albright - KYTC, TRIMARC Program Manager
- Gene Mason - KYTC, Director of Contract Procurement
- James Poturalski - Indiana DOT, Traffic Design Manager
- Dennis Luhrs - FHWA, Kentucky Division Office
- Paul Toussaint - Director, University of Kentucky Transportation Center

Mr. Toussaint's responsibility will be to prepare the reports described below. Mr. Mason will assist with bidder qualifications, wage rates, required Notices, standard contract provisions, etc.

The current schedule is to award the installation contract in January of 1998 and complete all work by September of 1998.

Reports will be prepared on actual implementation of bidding and installation procedures and will be designed to assist others in use of a true System Integration process. The reports will be prepared by the University of Kentucky Transportation Center. One report will be prepared within 90 days of contract awards, one within 90 days of contract completion and a final report after two years which will document any effect on TRIMARC Operations that might be due to the contracting procedures.