

A SYSTEMS APPROACH TO THE STUDY OF THE TRANSPORTATION
FACILITIES SERVING KSU STADIUM

by 45

WILLIAM LEE SMITH

B.S., Kansas State University, 1968

A MASTER'S REPORT

submitted in partial fulfillment of the

requirements for the degree


MASTER OF SCIENCE

Department of Civil Engineering

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1969

Approved by


Major Professor

LD
2668
R4
1969
561

TABLE OF CONTENTS

	PAGE
INTRODUCTION	1
SYSTEMS APPROACH	6
Goals and Objectives	10
System Elements (Subsystems)	11
Models	11
Generation of Alternatives	13
Evaluation of Alternatives	13
Implementation	14
APPLICATION OF PROCESS TO KSU STADIUM TRAFFIC STUDY	15
Goal and Objective of Project	15
System Elements	17
SEARCH FOR ALTERNATIVES	24
Systems Elements of the Surface Street System	24
Search for Alternatives for the Surface Street System	32
Systems Elements of the Modal Split System	43
Search for Alternatives for the Modal Split System	43
Systems Elements of the Lot Design System	48
Search for Alternatives for the Lot Design System	50
Systems Elements of the Signing System	50
Search for Alternatives for the Signing System	52
Systems Elements of the Fan Information System	57
Search for Alternatives for the Fan Information System	57
Systems Elements of the Interior Lot Management System	62
Search for Alternatives for the Interior Lot Management System	63
Feedback into the System Environment	66
EVALUATION OF ALTERNATIVES	70
IMPLEMENTATION	73
CONCLUSION	74
SUMMARY	79
REFERENCES	82

LIST OF TABLES

	PAGE
TABLE 1. Result of Study Comparing available parking Spaces and Walking distances to the old Memorial Stadium and the new KSU Stadium . . .	27

LIST OF PLATES

	PAGE
PLATE I Orientation of KSU Stadium with Respect to the complete Street system of the city of Manhattan	25

LIST OF FIGURES

	PAGE
FIGURE 1. Diagram of the Problem Solving Process	6
FIGURE 2. Steps in the Systems Process	10
FIGURE 3. Process Used in KSU Stadium Study	16
FIGURE 4. Initial Development of Process	17
FIGURE 5. Diagram Demonstrating Relationship between Subsystems and their Environment	20
FIGURE 6. Diagram of Process through the "System Elements" Step	21
FIGURE 7. Diagram of Interrelated Subsystems and their Respective Elements	22
FIGURE 8. Orientation of KSU Stadium with Respect to the city of Manhattan	24
FIGURE 9. Surface Street Relationship between St. Mary's Hospital and Lot 1 Entrance	31
FIGURE 10. The Surface Street System Surrounding the new Stadium	33
FIGURE 11. The most Advantageous Entrance Operation	34
FIGURE 12. The most Advantageous Exit Operation	36
FIGURE 13. Radio Controlled Intersections and Routes for Redirection of Traffic	37
FIGURE 14. Provisions for Emergency Vehicle flow at Intersection of Vaughn Dr. and College Avenue	40
FIGURE 15. Streets to be made One-Way for Pre-Game Operation	42
FIGURE 16. Streets to be made One-Way for Post-Game Operation	42
FIGURE 17. Proposed Exclusive Shuttle Bus Route	47
FIGURE 18. Lot Design of KSU Stadium Parking Facilities	48
FIGURE 19. Location of Direction Signs	55
FIGURE 20. Parking Control Signing	56

	PAGE
FIGURE 21. Map to be made Available to Out-of-Town Fans	59
FIGURE 22. Map to be made Available to In-Town Fans . . .	60
FIGURE 23. Map Showing Routes to Special Reserved Lot . .	61
FIGURE 24. Graphical Representation of the Stacking Operation	63
FIGURE 25. Positioning of Lot Managers and Communications	67
FIGURE 26. Graphical Representation of Bus Unloading and Stacking Operation	68
FIGURE 27. Diagram of Process through the "Search for Alternatives" Step	70
FIGURE 28. Graph of Cumulative Student Arrivals taken from the lot Entrance Counts	76
FIGURE 29. Graph of Cumulative Non-student Arrivals taken from the lot Entrance Counts	76
FIGURE 30. Graph of Cumulative Combined Arrivals taken from the Lot Entrance Counts and Queue Lengths	77