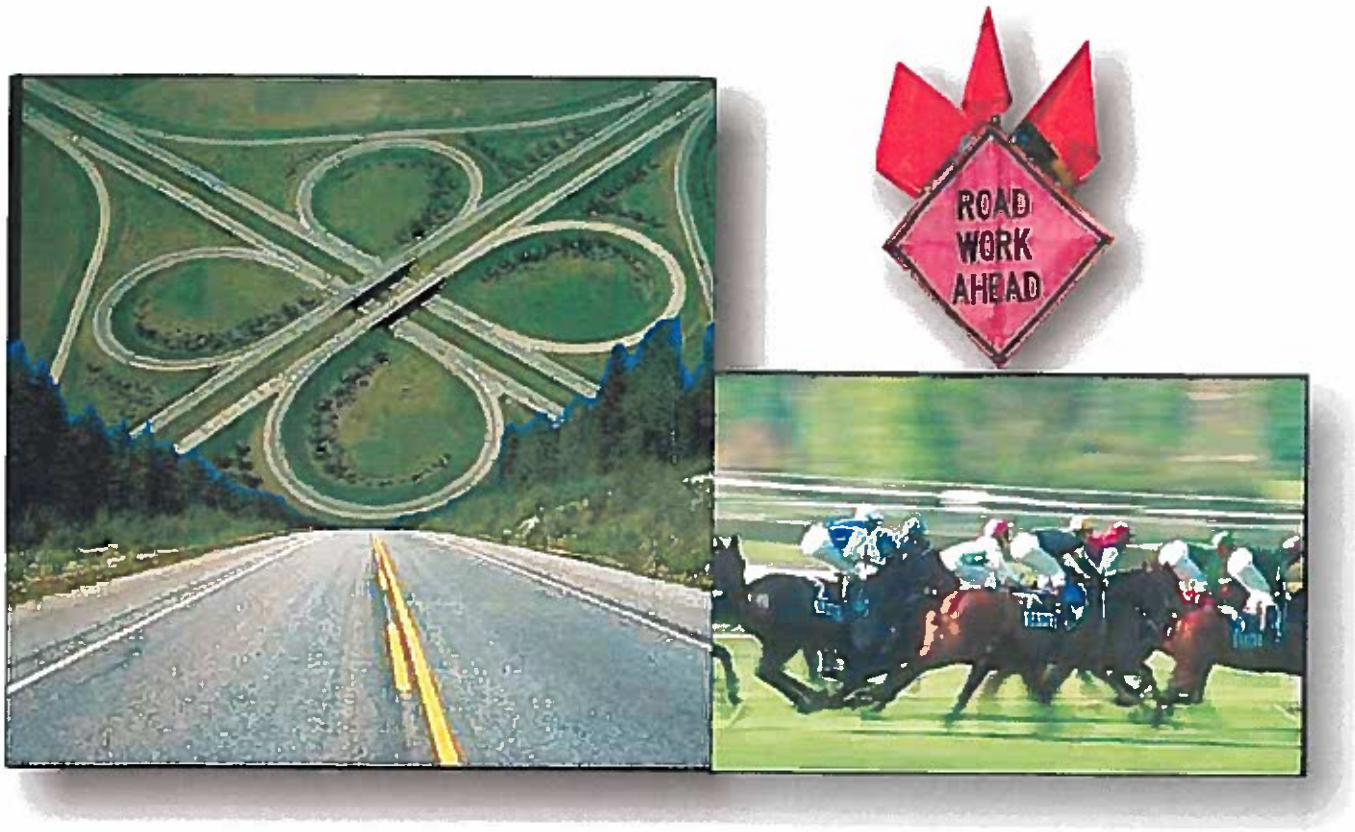


Gene Snyder Freeway (I-265) Interchanges (US 60 and I-64)

Jefferson County, KY

VALUE ENGINEERING STUDY

for

Kentucky Transportation Cabinet

Study Date: June 10-14, 2002

URS

GENE SNYDER FREEWAY (I-265) INTERCHANGES
(US 60 and I-64)

Jefferson County, Kentucky

VALUE ENGINEERING STUDY
for the
Kentucky Transportation Cabinet

Study Date: June 10 - 14, 2002

Final Report

June 27, 2002

URS Corporation

EXECUTIVE SUMMARY

General

URS conducted a Value Engineering (VE) Study on the reconstruction of the US 60 and I-64 interchanges with the Gene Snyder Freeway (I-265) on June 10-14, 2002. The topic was the schematic design documents provided to the VE Team by the Kentucky Transportation Cabinet that were produced by HNTB.

The VE team undertook the task assignment using a standard value engineering work plan and approach. Basically, the work plan depends on what could be referred to as a "bottom up" approach. With this approach, the VE Team subdivides the project into it's component parts and examines the functions and requirements, and then seeks to identify alternate approaches. The ideas that were generated from this process and chosen for full development are presented in Section 3 of this report.

However, given that this VE study was conducted early in the project design schedule, the VE team also considered a "top down" approach where the team stands back from the project being studied and looks at the project as independently and objectively as possible. This approach relies on the experience and professional background of the team and tends to be highly judgmental and is difficult to verify with an analytical process. Nonetheless, the analysis and subsequent recommendations resulting from this approach are worthy of review.

The result of both approaches are recommendations for value improvement to this project. These recommendations are presented to all project stakeholders for decision as to whether they should be implemented or not.

Significant Aspects of the Study

The Kentucky Transportation Cabinet previously selected the design alternatives for the project, which the value engineering team used as the basis for the VE study. As the study developed, the team reached the conclusion that the owner selected alternatives were indeed the best solutions for these locations. Accordingly, the team proceeded with the value engineering methodology of the proposed alternatives to identify possible high value, low cost ideas for improvement of value. In view of the high cost of the acquisition of the required Rights of Way, and the predicted negative public reaction to loss of ownership, particularly in several key areas of very expensive real estate, the team selected the reduction of ROW as the major item of study emphasis.

During the speculation phase of this VE study, 32 creative ideas were identified. 8 of these ideas were developed into VE recommendations for further consideration and 9 design comments with no easily quantifiable cost implications, but remain noteworthy to the results of the VE study. Many of the ideas represent changes in design approach, reconsideration of criteria, and in some cases, modification of the project scope. In general, the idea evaluation took into account the economic impact, other benefits obtained, and the effect on the overall project objectives.

In Conclusion

The value engineering team found that the project, at this early stage, had been well thought out by the Kentucky Transportation Cabinet and the design team. The two alternatives selected as the basis for design are considered by the value engineering team to be the best solution for these locations. As the proposals developed in the study demonstrate, there are considerable savings possible in the proposed alternatives with the reduction of ROW requirements. Relocation of ramps and the use of retaining walls where feasible, to reduce ROW, are two areas for emphasis which will not only reduce costs but will enhance public approval of the project.

The following table presents a summary of the ideas developed into recommendations and design comments with cost implications where applicable. Since cost is an important issue for comparison of VE proposals, the costs presented in this report are based upon original design quantities with unit rates obtained from the original cost estimate. Where proposed alternate designs included items not in the original scope, costs from similar projects and the VE team member expertise were used. The estimates include a mark-up of 25% for contingencies on construction where applicable.

SUMMARY OF RECOMMENDATIONS

I-64 / I-265 Interchange

Rec.#	Recommendation Title / Description	1st cost savings (or cost)
1	Modify ramps at the I-265 & I-64 Interchange	$12,803,499
3	Shorten Pope Lick Bridge by making it perpendicular to I-265	$414,750
4	Realign Pope Lick Rd. to more closely parallel I-64/I-265 EB/SB ramp	$904,000
18	Consider using 10' shoulder width versus 12' shoulder widths	$2,145,975

US-60 / I-265 Interchange

Rec.#	Recommendation Title / Description	1st cost savings (or cost)
1	Construct retaining walls in northwest quadrant of US-60 / I-265 Interchange to reduce ROW	$4,137,500
2	Provide alternative access to Boughman (Money Concepts) development parcels	$9,773,420
10	Keep existing US-60 interchange and construct an I-265 NB flyover ramp connecting to US-60 WB via Urton Lane	($123,534)
12	Eliminate sound wall protection on both interchanges	$5,568,000

DESIGN COMMENTS

I-64 / I-265 Interchange

8	Construct one lane crossovers
9	Modify alternate 1 to accommodate future cross over construction
15	Make provisions for future Urton Road underpass under I-64
16	Check limits of project on cost estimate
17	Make lighting tower lighting vs. mass-type lighting

US-60 / I-265 Interchange

3	Sell state-owned excess right of way not necessary for project
11	Control traffic flow on and off ramps with ITS system / traffic signals
14	Use existing shoulder widths on Aiken Road overpass structures
15	Shorten southbound auxiliary lane

Acknowledgments
The team appreciates the input and able assistance of Robert Semones and Joette Fields and all the staff members of the Kentucky Transportation Cabinet who participated throughout the study. Without their assistance, this successful value engineering study would not have been possible.

Value Engineering Study - Core Team

Name	Discipline / Role	Organization	Telephone
Stephen Curless, PE	Roadway Engineer	URS	513-419-3504
Jon Cox, PE	Structural Engineer	URS	513-419-3503
Mike Milligan, PE	Central Office Operations	KYTC	502-564-4556
C.W. Seymour, PE	Highway Engineer	URS	502-964-5391
Tala Quino, PE	District Representative	KYTC	502-367-6411
Joe Waits, PE, CVS	VE Team Leader	URS	251-666-2184
Mark Watson, EIT, CVS	Asst. Team Leader	URS	913-344-1045
Dave Wormald, PE	Highway Engineer	URS	513-419-3503

Certification
This is to verify that the Value Engineering Study was conducted in accordance with standard Value Engineering principles and practices.

Merle Braden, PE, CVS
Value Engineering Program Manager

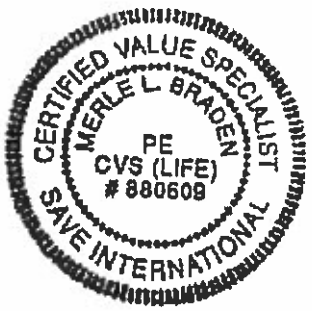


TABLE OF CONTENTS

Section and Title *Page No.*

Appendices

SECTION 1 - INTRODUCTION

This report documents the results of a value engineering study on the reconstruction of the Gene Snyder Freeway (I-265) Interchanges (US 60 and I-64). The study workshop was held at the offices of the Kentucky Transportation Cabinet (KYTC) on June 10 - 14, 2002. The study team was from URS and KYTC and was facilitated by a CVS team leader from URS. The names and telephone numbers of all participants in the study are listed in Appendix A.

The Job Plan

The study followed the value engineering methodology as endorsed by SAVE International, the professional organization of value engineers. This report does not include an explanation of standard value engineering / value analysis processes used during the workshop in development of the results presented herein. This would greatly expand the size of the report. The purpose of the report is to document only the results of the study.

Ideas and Recommendations

Part of the value engineering methodology is to generate as many ideas as is practical and to then evaluate each idea and select as candidates for further development only those ideas that offer added value to the project. If an idea thus selected turns out to work in the manner expected, that idea is put forth as a formal value engineering recommendation. Recommendations represent only those ides that are proven to the VE team's satisfaction.

Design Comments

Some ideas that did not make the selection for development as recommendations, were, never the less judged worthy of further consideration. These ideas have been written up as Design Comments and are included after the recommendations in Section 3.

Level of Development

Value Engineering studies are working sessions for the purpose of developing and recommending alternative approaches to a given project. As such, the results and recommendations presented are of a conceptual nature, and are not intended as a final design. Detailed feasibility assessment and final design development of any of the recommendations presented herein, should they be accepted, remain the responsibility of the designer.

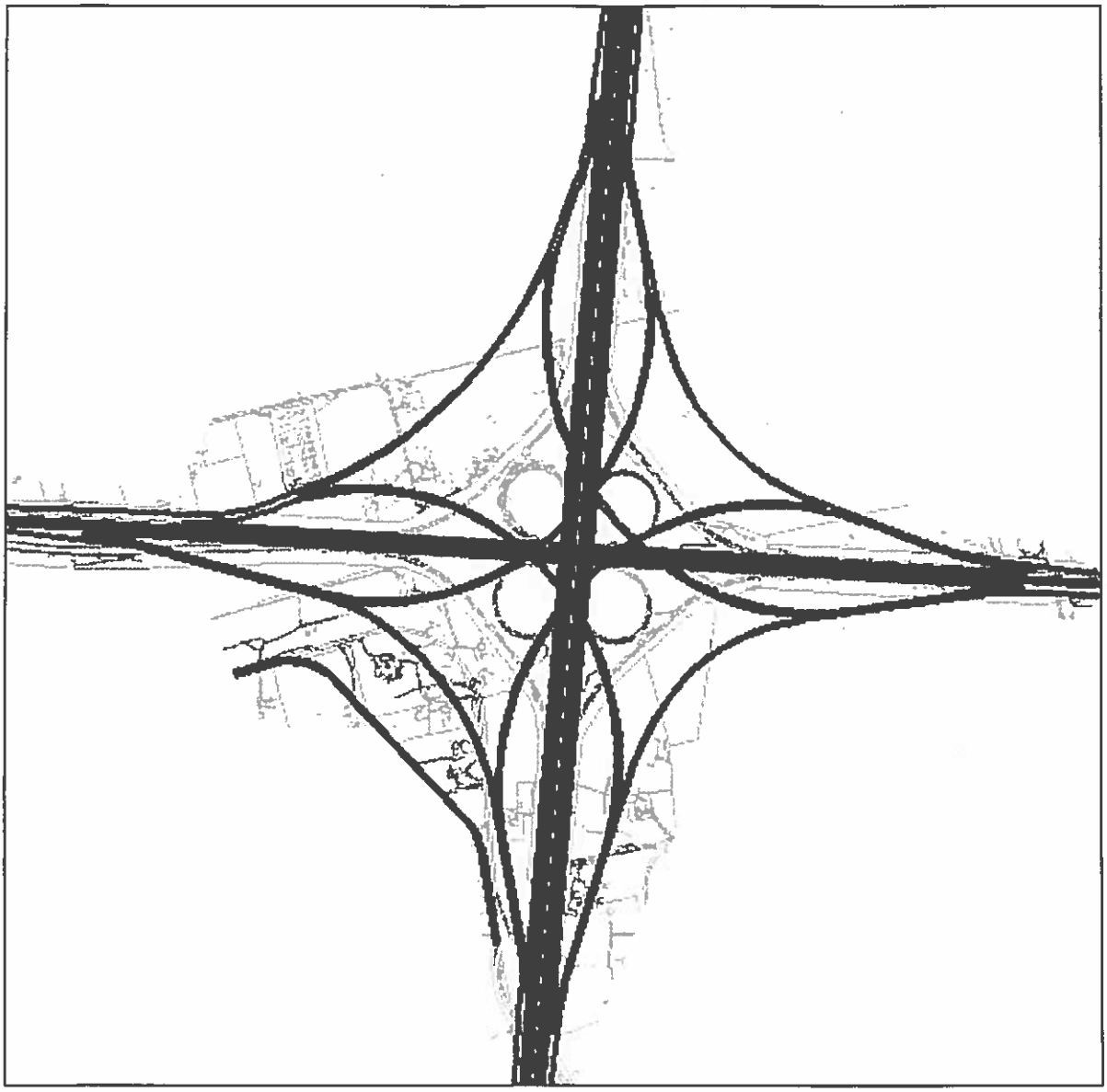
Organization of the Report

The report is organized in the following outline.

1. Introductory Information
    a. Section 1- Introduction
    b. Section 2- Project Description
2. Primary body of results.....Section 3- Recommendations and Design Comments
4. Supporting documentation.....Appendices

SECTION 2 – PROJECT DESCRIPTION

The project consists of construction of new Interchanges at the intersection of I-265/I-64 and at the intersection of I-265/US 60, approximately one mile apart in the vicinity of Louisville, Kentucky. The existing interchange at I-265/I-64 consists of a diamond with four leaf clover ramps to accommodate a growing traffic load in and out of the Louisville area. The major problem with the existing interchange is identified as the short weave distance between ramps creating traffic build-up and driver delays. The projected traffic flow into the year 2025 justifies construction of the proposed alternative, directional ramp flyovers for this location. Similar traffic conditions exist at the US 60 interchange with a diamond configuration that will be replaced by a single point urban interchange. Due the urban location of the two interchanges, a major part of the project costs will be for the required Rights of Way to accommodate construction. Maintenance of traffic will be a major focus area for the project to minimize further driver delays.

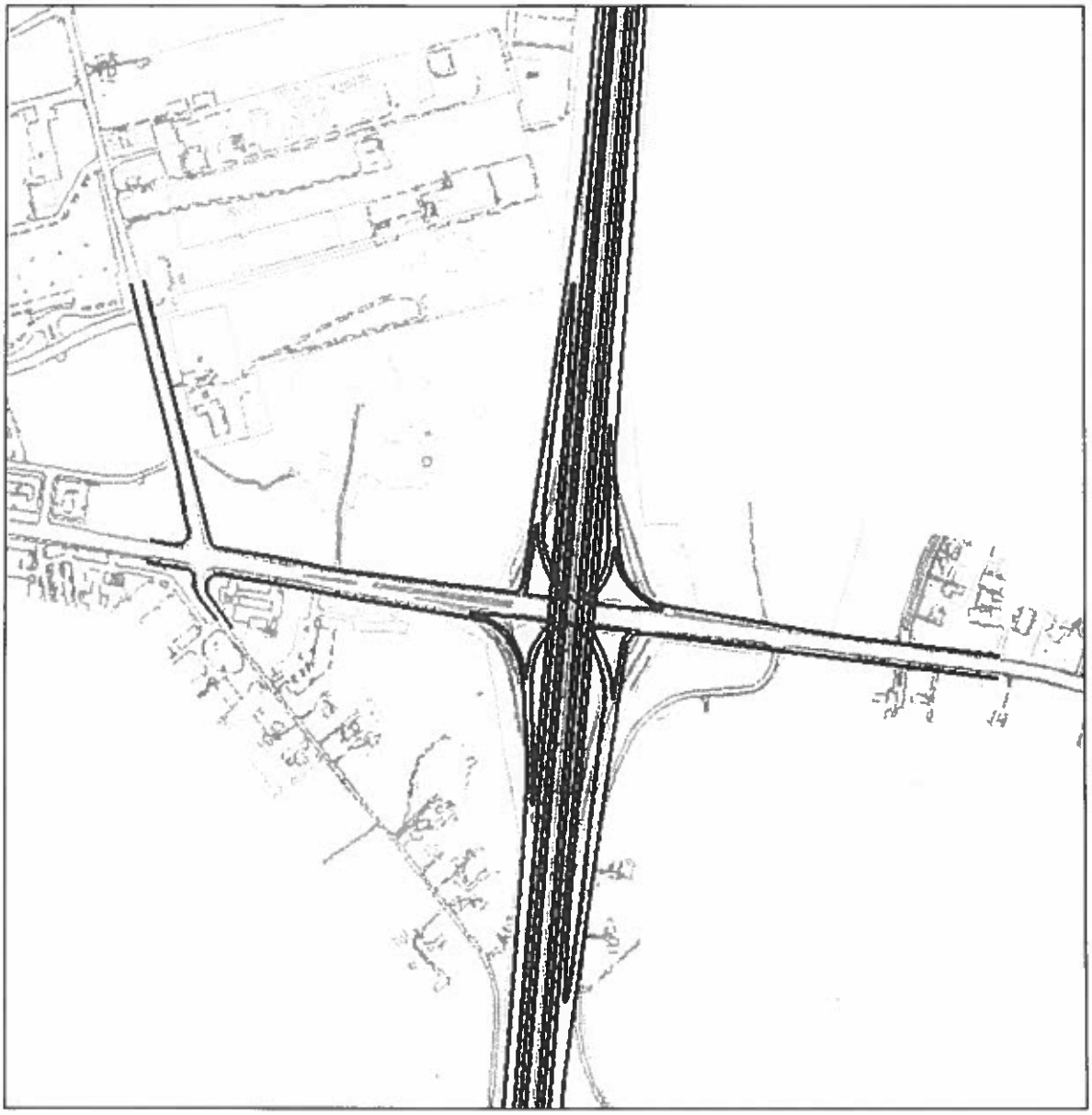


I-265 / I-64 Interchange
Alternate 2
Item No. 5-021.0

KENTUCKY TRANSPORTATION CABINET

HNTB

Design	$3,300,000
Right-of-Way	$17,820,000
Utilities	$5,110,000
Construction	$68,250,000
Total	**$94,480,000**



I-265 / US 60 Interchange
Alternate 4
Item No. 5-041.0

Design	$1,500,000
Right-of-Way	$26,801,000
Utilities	$2,445,000
Construction	$26,425,000
Total	**$57,171,000**

SECTION 3 - VE RECOMMENDATIONS

This section contains the complete documentation of all recommendations to result from this study. Each recommendation is marked by a unique identification number. This number is assigned from the Creative Idea List and is used throughout the report to uniquely refer to a given recommendation. The parent idea, or ideas, from which the recommendation began can be determined from the Creative Idea List where the recommendation number is shown adjacent to the corresponding parent idea.

Organization of Recommendations
The recommendations presented on the following pages are organized numerically by identification number. Recommendations concerning the I-265 and I-64 interchange are presented first followed by recommendations concerning the I-265 and US 60 interchange.

Each recommendation is documented by a separate write-up that includes a description of the recommendation, a list of advantages and disadvantages, sketches where appropriate, calculations, cost estimate, and the economic impact of the recommendation on the first cost, and where applicable, the life cycle cost. The economic impact is shown in terms of savings or added cost.

VE RECOMMENDATIONS on the I-265 and I-64 Interchange

The following recommendations are focused on the I-265 and I-64 interchange. While a majority of the recommendations concern only this interchange, some recommendations may refer to the I-265 and US 60 interchange or be applicable to that interchange as well. Where appropriate, this is noted in the documentation of the specific recommendations.

VALUE ENGINEERING RECOMMENDATION # 1

PROJECT: I-64 / US-60 & I-265 Interchange Reconstruction Projects
LOCATION: Middletown, KY
STUDY DATE: June 10 – 14, 2002

DESCRIPTIVE TITLE OF RECOMMENDATION:
Modify ramps at the I-265 & I-64 Interchange

ORIGINAL DESIGN:
The original design is a fully directional, four-level interchange with the interior ramps within the area of the current loop ramps. The design speeds for the ramps are set at approximately 63 mph or radii of approximately 2,000 feet.

RECOMMENDED CHANGE:
Reduce the radii of the ramps to more closely reflect the 50 mph design speed criteria. Relocate two of the interior ramps to outside of the current loop ramps.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$38,876,569		$38,876,569
RECOMMENDED DESIGN	$26,073,070		$26,073,070
ESTIMATED SAVINGS OR (COST)	$12,803,499		$12,803,499

VALUE ENGINEERING RECOMMENDATION # 1

ADVANTAGES:

- Reduces amount of right of way required
- Eliminates necessity to move Christian Academy ball field
- Improve the maintenance of traffic during construction
- Reduces requirement to relocate the overhead power lines
- Reduces amount of structure required

DISADVANTAGES:

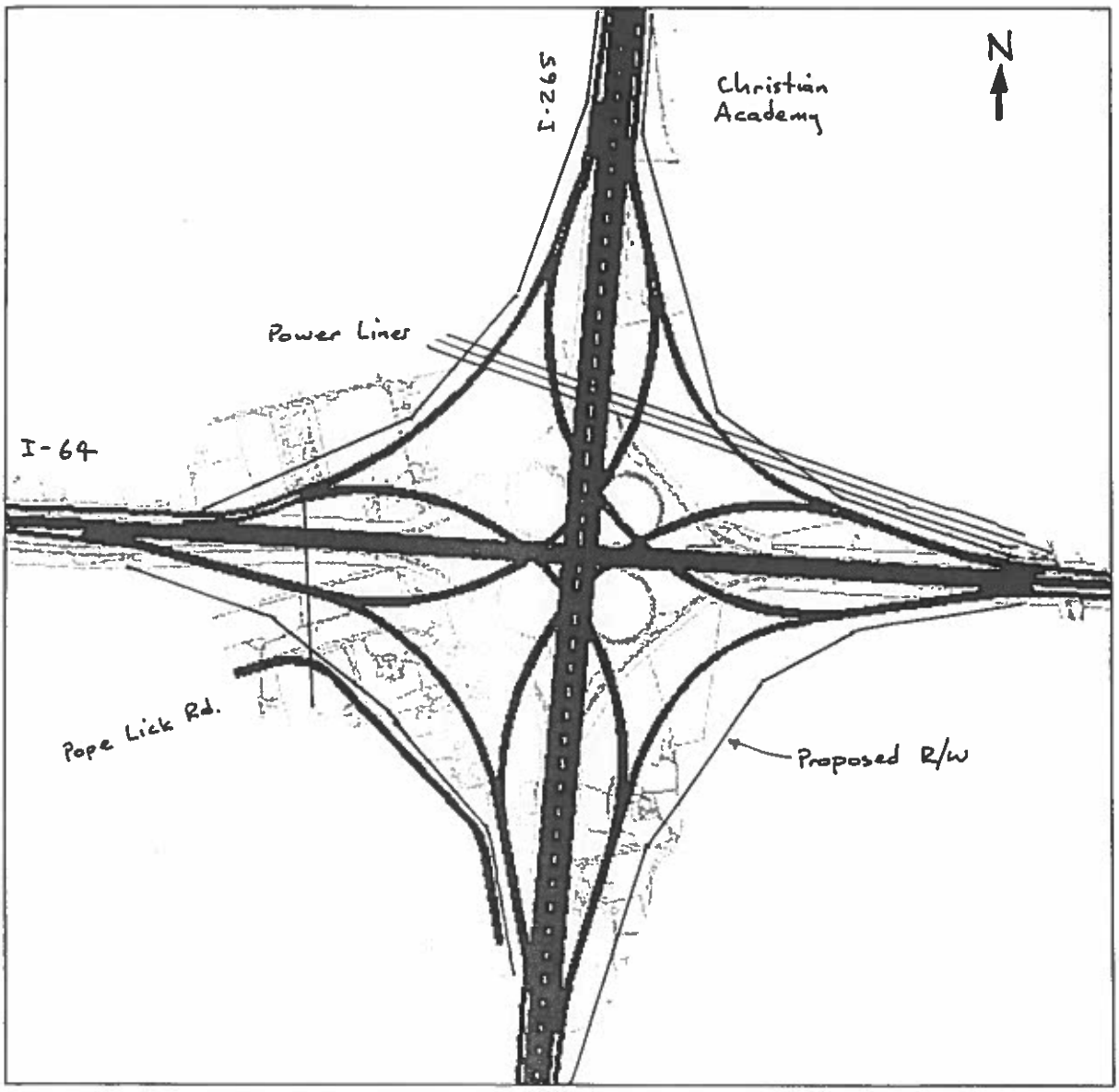
- Reduces excess design speed

JUSTIFICATION:

The design speed of interstate flyovers on this project has been set by the FHWA to be 50 mph. This number was based upon the criteria for flyover ramp design speed to be 70% of the mainline design speed (i.e. 70% of 70 mph = 49 or 50 mph) . This proposal simply recommends that the project be designed to the criteria set for it and eliminate the excess design speed in the I-64/I-265 interchange ramps. The resulting design will functionally be equivalent to the original design (i.e. mitigation of congestion) while gaining the benefits of reduced right of way takes and cost savings.

Moving the interior ramps outside of the existing loop ramps would assist in maintenance of traffic by allowing the use of cloverleaf ramps during construction.

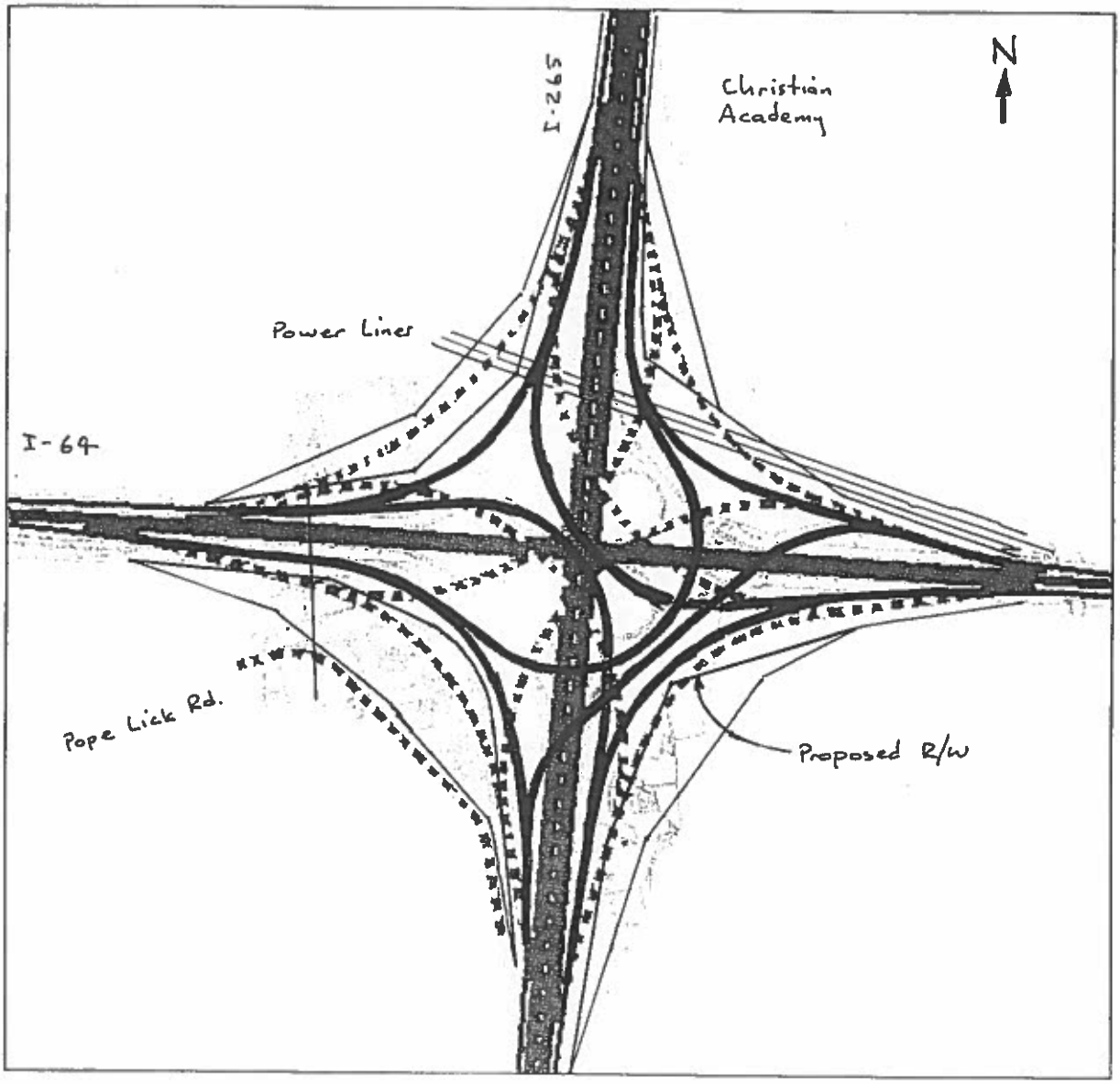
Only one tower of the power lines running north of the interchange will have to be relocated with the proposed alignment due to a reduction in total height of the interchange.



I-265 / I-64 Interchange
Alternate 2
Item No. 5-021.0

KENTUCKY TRANSPORTATION CABINET

HNTB



I-265 / I-64 Interchange
Alternate 2
Item No. 5-021.0

KENTUCKY TRANSPORTATION CABINET

HNTB

URS

Job KYTC Value Engineering | Project No. | Page ___ of ___
Description I 64 / I 265 | Computed by SCC | Sheet ___ of ___
| Checked by | Date June, 02
| | Date
Reference

RAMP		TOTAL LENGTH ft.	BRIDGE LENGTH ft.	ROADWAY LENGTH ft.	EARTHWORK C.Y. x 1000	PAVEMENT S.Y. x 1000
EB/NB	Orig.	3900	1400	2500	140	22
	Prop.	4000	1200	2800	150	25
	Change	+100	-200	+300	+10	+3
EB/SB	Orig.	5400		5400	109	6
	Prop.	5700		5700	120	6
	Change	+300		+300	+11	0
WB/SB	Orig.	4000	1600	2400	150	21
	Prop.	4500	1800	2700	160	24
	Change	+500	+200	+300	+10	+3
WB/NB	Orig.	5700		5700	112	6
	Prop.	5300		5300	110	6
	Change	+200		+200	-2	0
NB/WB	Orig.	4300	900	3400	123	24
	Prop.	4000	700	3300	120	23
	Change	-300	-200	-100	-3	-1
NB/EB	Orig.	5600		5600	125	6
	Prop.	5900		5900	130	6
	Change	+300		+300	+5	0
SB/EB	Orig.	4000	1200	2800	70	22
	Prop.	3500	700	2800	70	22
	change	-500	-500	0	0	0
SB/WB	Orig.	4700		4700	36	10
	Prop.	5000		5000	40	11
	Change	+300		+300	+4	+1

URS

Job KY TC Value Engineering | Project No. | Page ___ of ___
Description I 64 / I 265 | Computed by SCC | Sheet ___ of ___
Checked by | Date June, 02
Reference

RAMP		TOTAL LENGTH ft.	BRIDGE LENGTH ft.	ROADWAY LENGTH ft.	EARTHWORK C.Y. x1000	PAVEMENT S.Y. x1000
TOTALS	Orig.	37,000	5100	31,900	865	117
	Prop.	37,900	4400	33,500	900	123
	Change	+ 900	- 700	+ 1,600	+35	+6

Costs

Net $ (millions)

Bridge

Original Cost Flyover Structures : $21.65 million
Cost reduction = ($21.65 ÷ 5100) x 700 = 2.97 — 3.0

MSE Walls

Original Cost MSE Walls @ Flyovers — 5.5

Earthwork

Original Cost = $4.28 million
Orig. total Earthwork = 404,491 + 1,712,722
= 2,117,000 cy
Cost addition = ($4.28 ÷ 2,117,000) x 35,000 — + 0.1

Pavement (Roadway)

Original Roadway Cost = $ 21.66 million
Original total Pavement : 477,487
Cost addition = ($ 21.66 ÷ 477) x 6 — + 0.3

Maintenance of Traffic

Cost reduction unspecified

URS

Job Value Eng | Project No. | Page ___ of ___
Description T-64/265 Row | Computed by DLW | Sheet ___ of ___
Alt. 2 Modified | Checked by | Date
Reference

SE Quadrant

Parcel #	Price		
11	2,000		
12	20,000		
13	28,000		
14	110,000	* SFR	Assume no takes 160,000
1	14,500		
2	15,000		
3	19,000		
4	40,500		Assume 1/3 reduction of partial takes
5	46,000		95,000
10	150,000		

Total SE Quad = 255,000

URS

Page ____ of ____

Job _____ Project No. _____ Sheet ____ of ____

Description _____ Computed by DLW Date _____

_____ Checked by _____ Date _____

Reference

SW Quadrant.

Parcel #	Price	
12	325,000	* SFN
13	650,000	*
14	275,000	*
15	275,000	*
16	250,000	*
17	25,000	
18	20,000	
19	5,000	
1	2,000	

} Assume No take total 1,827,000

2 —

3 37,000 Assume 50% of partial take $18,500

Total SW Quadrant = 1,845,500.00

URS

Page ____ of ____

Job _____ Project No. _____ Sheet ____ of ____

Description _____ Computed by DLW Date _____

_____ Checked by _____ Date _____

Reference

NW Quadrant

Parcel	Price	
1	193,000	= Assume 1/3 reduction in partial take = 64,333
3	400,000	• Assume partial take with dwelling unit save 25% = 100,000
5*	56,200	= Assume 1/2 reduction in partial take: $23,100

* Original Estimate does not reflect acquisition and modification or relocation of LGE substation.

P-G	5,000	= Assume 1/2 reduction in partial take. $2,500

Trial = 194,933

URS

Page ____ of ____

Job _____ Project No. _____ Sheet ____ of ____

Description _____ Computed by DLW Date _____

_____ Checked by _____ Date _____

Reference

NE Quadrant

Parcel No	Price	
1	207,000 + 300,000 improvements	Assume 20% reduction in partial take = 41,400
2	499,000 + 300,000 improvements	Assume 60% reduction in partial take, save fields, 599,400
3 & 4	25.40 acres = 1,778,000 @ 70,000/acre	Assume 3.25 acre reduction in partial take = 227,500

Total = $368,300

URS

Page ____ of ____

Job _____ Project No. _____ Sheet ____ of ____

Description _____ Computed by DLW Date _____

_____ Checked by _____ Date _____

Reference

Totals

SE	255,000
SW	1,845,000
NW	194,933
NE	868,300
	$3,163,233

1.40 × 3,163,233 = 4,428,526

6 × 25,000 relocation = 150,000

6 × 6000 demo = 36,000

6 × 3,000 asbestos = 18,000

4,632,526

Say 4.6 million

VALUE ENGINEERING RECOMMENDATION # 1

COST ESTIMATE - FIRST COST

Cost Item	Units	$/Unit	Source Code	Original Design		Recommended Design	
				Num of Units	Total $	Num of Units	Total $
Bridge Construction	LF	4,244.17	1	5,100	$21,645,249	4,400	$18,674,332
MSE Walls	SF	27.30	1	203,039	$5,542,965		
Earthwork	CY	2.02	1	865,000	$1,749,533	900,000	$1,820,323
Roadway Pavement	LF	45.35	1	117,000	$5,306,297	123,000	$5,578,415
ROW	LS				$4,632,526		
Subtotal					$38,876,569		$26,073,070
Mark-up (included)							
Total					$38,876,569		$26,073,070

SOURCE CODE:
1 Project Cost Estimate
2 CES Data Base
3 CACES Data Base
4 Means Estimating Manual
5 National Construction Estimator
6 Vendor Lit or Quote (list name / details)
7 Professional Experience (List job if applicable)
8 Other Sources (specify)

VALUE ENGINEERING RECOMMENDATION # 3

PROJECT: I-64 / US-60 & I-265 Interchange Reconstruction Projects
LOCATION: Middletown, KY
STUDY DATE: June 10 – 14, 2002

DESCRIPTIVE TITLE OF RECOMMENDATION:
Shorten Pope Lick Bridge by making it perpendicular to I-265

ORIGINAL DESIGN:
Pope Lick Road crosses I-64 at approximately a 45 degree angle. As part of this reconstruction project, the bridge will have to be rebuilt.

RECOMMENDED CHANGE:
Realign Pope Lick Road with a crossing angle of 90 degrees to I-265.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$1,921,600		$1,921,600
RECOMMENDED DESIGN	$1,506,850		$1,506,850
ESTIMATED SAVINGS OR (COST)	$414,750		$414,750

VALUE ENGINEERING RECOMMENDATION # 3

ADVANTAGES:

- Reduces amount of structure
- Improves maintenance of traffic during construction

DISADVANTAGES:

- Requires the acquisition of more ROW
- Requires additional construction of Pope Lick Road

JUSTIFICATION:

This recommendation takes advantage of the fact that Pope Lick Bridge will be replaced as part of this project to realign the bridge consequently making it shorter.

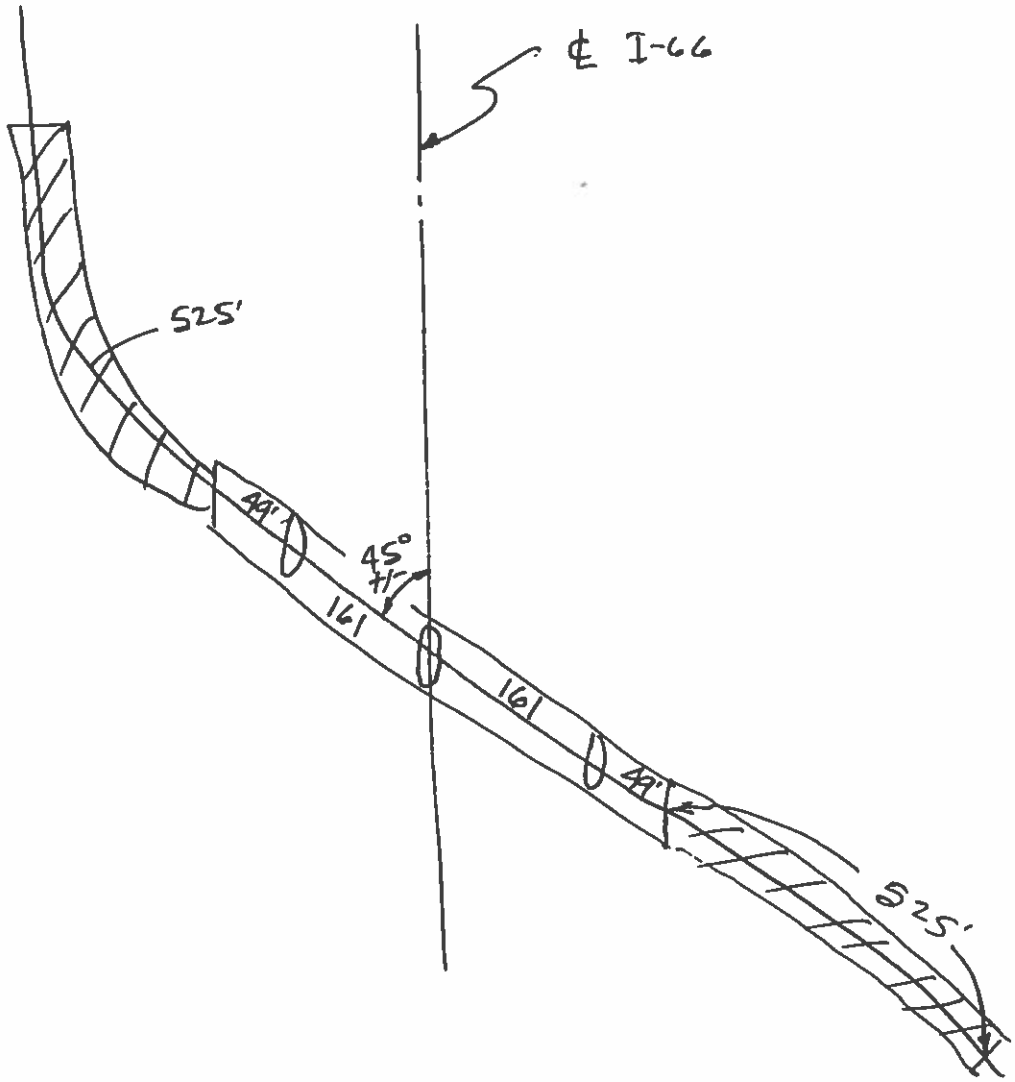
The relocation of the bridge to the south will allow Pope Lick Road to remain open during construction until the traffic can be transferred to the new bridge.

Note: The reconstruction of Pope Lick Bridge was not included in the project cost estimate.

I-64

VALUE ENGINEERING RECOMMENDATION # 3

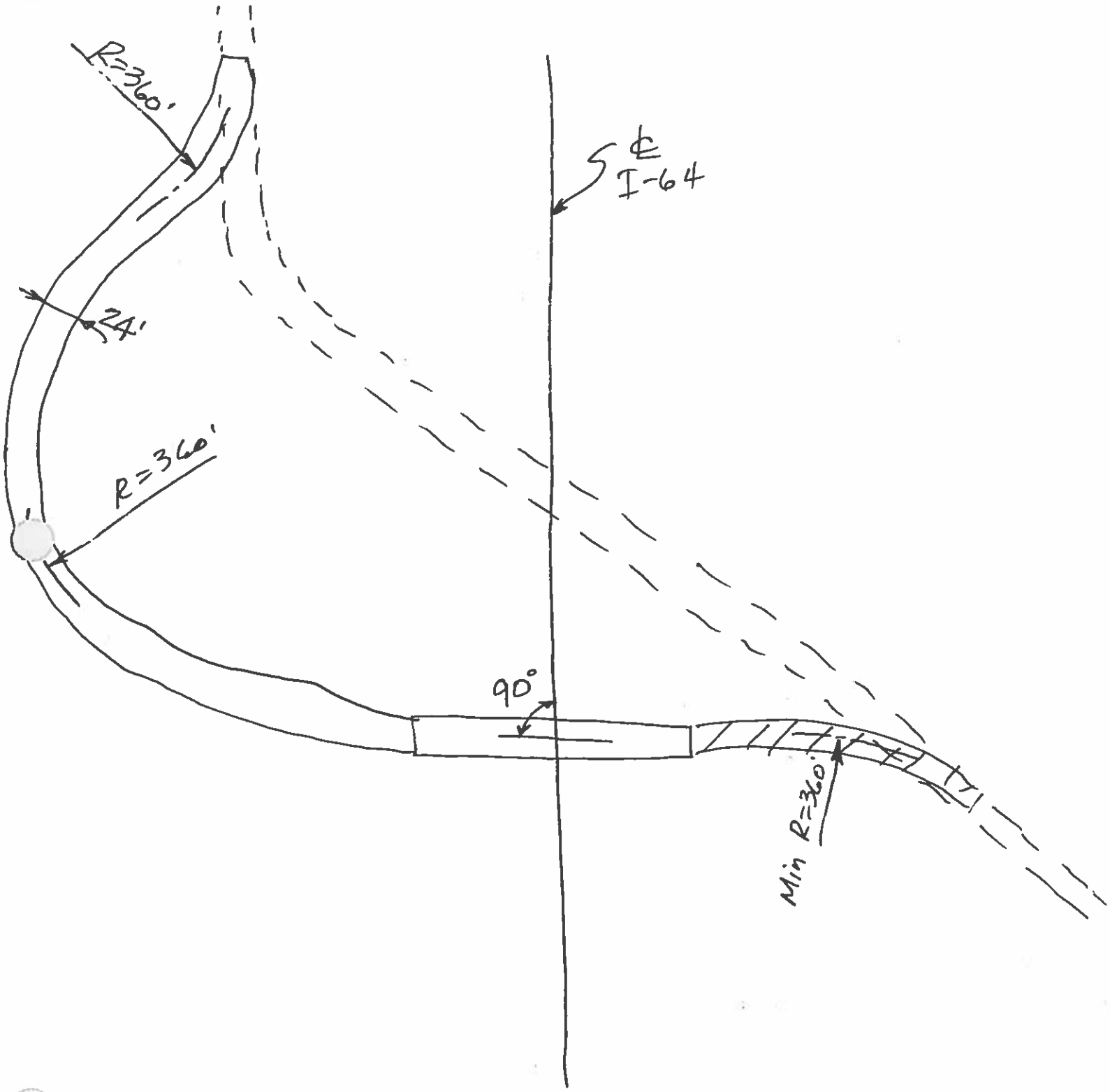
SKETCH OF ORIGINAL DESIGN



I-64

VALUE ENGINEERING RECOMMENDATION # 3

SKETCH OF RECOMMENDED DESIGN

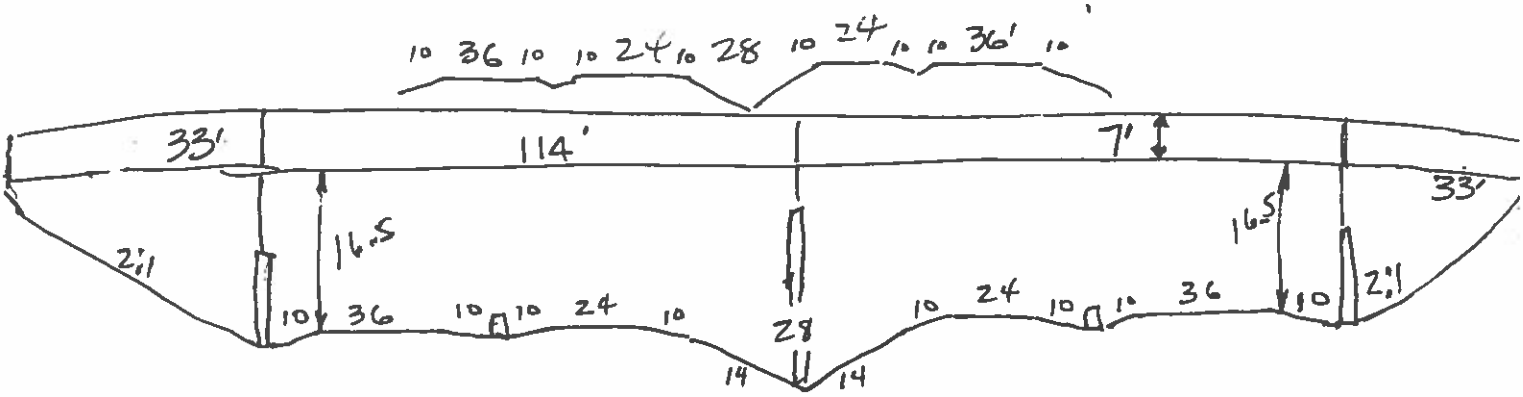


KEC #3
I-64

(1)

#105 / S.F.
Bridge Deck Area

NEW Pope lick Bridge



4- Span 2@ 33 = 66
2@ 114' = 228
294

2@1.5 + 2@4 + 24 = 35
Barriers Shldrs

So NEW Bridge @ ⊥ to I-265

ours

DECK Area = 35 x 294 = 10,290 S.F.
x $105/S.F. = $1,080,450

45° 294 theirs

Say 45° skew ∴ L = 294 ÷ cos45° ≈ 420'
420 x 35 = 14,700 S.F. @ $120/S.F.
Say Top/SLAB to Bot/Beam = 5'
= $1,764,000

Say Rdwy. Pav't

VALUE ENGINEERING RECOMMENDATION # 3

COST ESTIMATE - FIRST COST

Cost Item	Units	$/Unit	Source Code	Original Design		Recommended Design	
				Num of Units	Total $	Num of Units	Total $
Perpendicular Bridge	SF	105.00	7			10,290	$1,080,450
Angled Bridge	SF	120.00	7	14,700	$1,764,000		
Roadway (Pope Lick)	SY	52.00	7	2,800	$145,600	5,200	$270,400
ROW	Ac	12,000	7	1	$12,000	13	$156,000
Subtotal					$1,921,600		$1,506,850
Mark-up (included)							
Total					$1,921,600		$1,506,850

SOURCE CODE:
1 Project Cost Estimate
2 CES Data Base
3 CACES Data Base
4 Means Estimating Manual
5 National Construction Estimator
6 Vendor Lit or Quote (list name / details)
7 Professional Experience (List job if applicable)
8 Other Sources (specify)

VALUE ENGINEERING RECOMMENDATION # 4

PROJECT: I-64 / US-60 & I-265 Interchange Reconstruction Projects
LOCATION: Middletown, KY
STUDY DATE: June 10 – 14, 2002

DESCRIPTIVE TITLE OF RECOMMENDATION:
Realign Pope Lick Rd. to more closely parallel I-64/I-265 EB/SB ramp

ORIGINAL DESIGN:
Original Design realigns Pope Lick Rd. from its original alignment to an alignment SW of the existing to avoid new EB to SB ramp and associated fill slopes.

RECOMMENDED CHANGE:
Realign Pope Lick Road to more closely parallel the EB to SB ramp.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$904,000		$904,000
RECOMMENDED DESIGN	$0		$0
ESTIMATED SAVINGS OR (COST)	$904,000		$904,000

VALUE ENGINEERING RECOMMENDATION # 4

ADVANTAGES:

- Requires less ROW acquisition
- Preserves residential property and structures
- Allows for comprehensive planning for potential N-S arterial road connecting Urton Lane and Pope Lick Road to Taylorsville Road.

DISADVANTAGES:

- Radius of curvature of Pope Lick Road is retained versus relatively straight line of Original Design

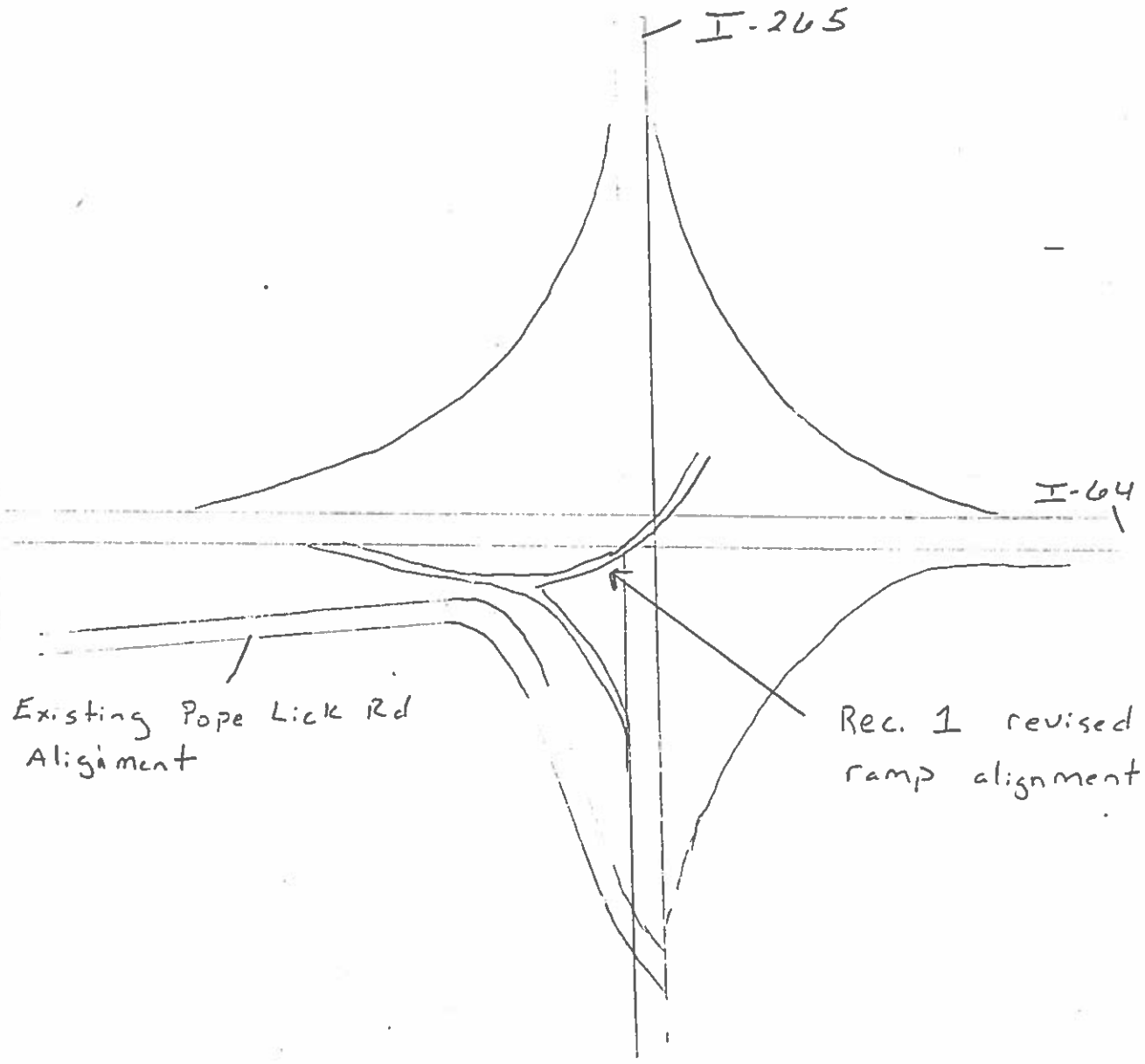
JUSTIFICATION:

Pope Lick Road is a relatively rural road with little traffic flow. The recommended change to the alignment would minimize the impact to the local community while relocating the road out of the interchange right of way.

There is a potential that if Recommendation 1 of the I-64 & I-265 Interchange is accepted, Pope Lick Road could remain on it's existing alignment and ROW (see Sketch # 2). This would maximize the benefit by eliminating the need to acquire any additional right of way for the Pope Lick Road relocation.

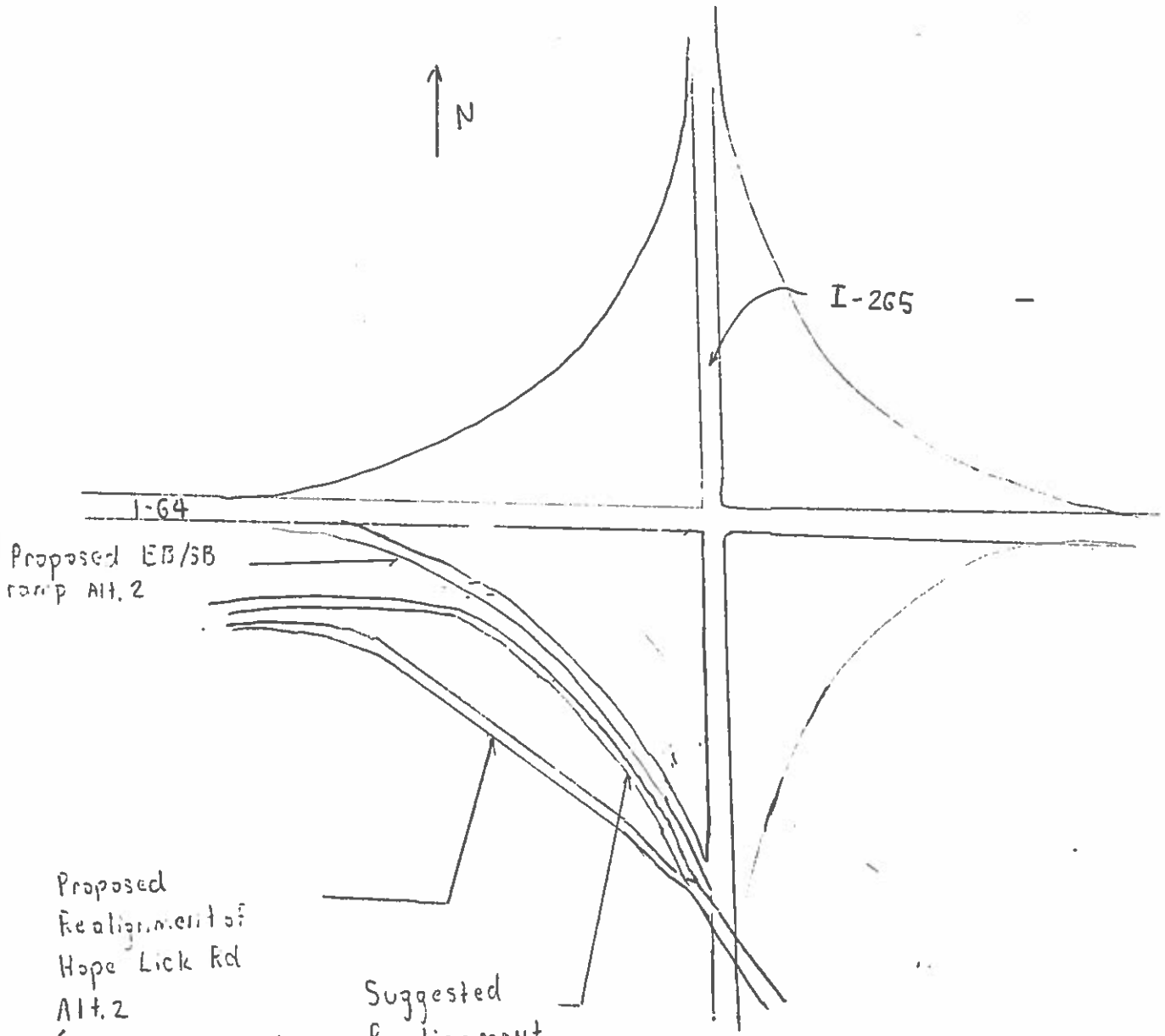
VALUE ENGINEERING RECOMMENDATION # 4

SKETCH OF ORIGINAL DESIGN



VALUE ENGINEERING RECOMMENDATION # 4

SKETCH OF RECOMMENDED DESIGN



VALUE ENGINEERING RECOMMENDATION # 4

CALCULATIONS

Note: The cost estimate provided to the VE team did not take the relocation of Pope Lick Road into account (see Design Comment 16. The amounts of right away takes have been scaled off of the project documents.

Elimination of total right of way takes by parcel number:

Parcel 12:	$325,000
Parcel 17:	$362,000
Parcel 13:	$135,000
Parcel 19:	$5,000

Demolition of Existing:

Lump Sum = $12,000

Reconstruction of Roadway

Lump Sum = $15,000

Total Cost Savings = $904,000

Note: Based upon rough estimations of right of way takes, should the alignment proposed in Recommendation 1 be accepted, the total amount saved would be approximately $3,400,000.

VALUE ENGINEERING RECOMMENDATION # 18

PROJECT: I-64 / US-60 & I-265 Interchange Reconstruction Projects
LOCATION: Middletown, KY
STUDY DATE: June 10 – 14, 2002

DESCRIPTIVE TITLE OF RECOMMENDATION:
Consider using 10' shoulder width versus 12' shoulder widths

ORIGINAL DESIGN:
The original design shows 12' inside and outside shoulders on I-265 and collector/distributor roads. I-64 will have 12' outside shoulders.

RECOMMENDED CHANGE:
Consider changing all 12' shoulders to 10' shoulders to be consistent with current design standards for high type facilities (AASHTO Green Book).

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$14,966,900		$14,966,900
RECOMMENDED DESIGN	$12,820,990		$12,820,990
ESTIMATED SAVINGS OR (COST)	$2,145,910		$2,145,910

VALUE ENGINEERING RECOMMENDATION # 18

ADVANTAGES:

- Potential reduction in ROW acquisition requirements
- Potential reduction in amount of pavement and earthwork required

DISADVANTAGES:

None apparent

JUSTIFICATION:

The current AASHTO design standards show 10' shoulder widths are acceptable for this level of roadway. This recommendation suggests eliminating the excess shoulder width and designing to the current design standards.

VALUE ENGINEERING RECOMMENDATION # 18

CALCULATIONS

I-265 Mainline

Reduce 8 -12' shoulders to 8 -10' shoulders (96' to 80')

I-64 cost estimate shows 94,740 yd^2
US 60 cost estimate shows 55,074 yd^2

Original Design Total 149,814 yd^2

149,814 yd^2 / 9 ft^2/yd^2 / 96 feet = 14,045 LF

Recommended Design Total

14,045 LF x 80' = 1,123,600 / 9 ft^2/yd^2 = 124,844 yd^2

I-64 Mainline

2 – 12' shoulders to 2 – 10' shoulders (4' total reduction)

724,013 ft^2 / 40' (shoulder width) = 18,100 LF

2 x 12' shoulders x 18,100 LF = 434,400 / 9 = 48,267 yd^2

2 x 10' shoulders x 18,100 LF = 362,000 / 9 = 40,222 yd^2

VALUE ENGINEERING RECOMMENDATION # 18

COST ESTIMATE - FIRST COST

Cost Item	Units	$/Unit	Source Code	Original Design		Recommended Design	
				Num of Units	Total $	Num of Units	Total $
Shoulder Pavement	SY	52.00	1	149,814	$7,790,328	124,844	$6,491,888
Shoulder Pavement	SY	52.00	1	48,267	$2,509,884	40,222	$2,091,544
Subtotal					$10,300,212		$8,583,432
Mark-up		@	25%		$2,575,053		$2,145,858
Total					$12,875,265		$10,729,290

SOURCE CODE: 1 Project Cost Estimate
2 CES Data Base
3 CACES Data Base
4 Means Estimating Manual
5 National Construction Estimator
6 Vendor Lit or Quote (list name / details)
7 Professional Experience (List job if applicable)
8 Other Sources (specify)

VALUE ENGINEERING DESIGN COMMENT # 8

DESCRIPTIVE TITLE OF DESIGN COMMENT:
Revise two lane ramp requirement to one lane where applicable

COMMENTARY:

The traffic counts indicated on certain directions of the I-64 / I-265 interchange are currently not high enough to justify two lane ramps. The criteria for two lane ramps is driven by the desire to retain traffic movement during accidents, snow/ice events, etc and to complete all congestion mitigation work on the interchange at one time. A one lane ramp would be 29 feet in total width and a two lane ramp would be 40 feet in total width. However, the actual lane widths would be 16' for a one lane and 24' for two lanes (12' for each lane). Consideration could be given to constructing ramps in the east to south and south to east directions as one lane ramps. A possibility could be to construct slightly wider shoulders on the one lane ramps to retain traffic flow during blockage events. The advantages of this would be a reduction in structure, roadway, and earthwork requirements. The disadvantage would be having to widen the ramps into two lanes in the future if the traffic volumes significantly increase.

VALUE ENGINEERING DESIGN COMMENT # 9

DESCRIPTIVE TITLE OF DESIGN COMMENT:
Modify Alternate 1 to accommodate the construction of flyovers in future

COMMENTARY:

The traffic counts indicated on certain directions of the I-64 / I-265 interchange are currently not high enough to justify multi-directional flyover ramps. Alternate 1 of this interchange reconstruction proposed constructing loop ramps for the east to south and south to east directions. The decision to go with Alternate 2 (multi-directional flyovers for all ramps) was driven by the desire to complete all congestion mitigation work on the interchange at one time. Future traffic count estimations indicate that the loop ramps will eventually need to be replaced with flyover ramps. While Alternate 2 has been selected as the preferred alternate, the $20 million cost increase from Alternate 1 may warrant further consideration of the latter option. Modifications the alternative to simplify the future replacement of the loop ramps with flyover ramps may tip the scales of the decision to go with Alternate 2. These modifications may consist of using bituminous construction for the loop ramps or even constructing a portion of the future flyover ramps as part of this project. The advantages of this would be a fully-functional project for a significant cost savings over a period of ten to fifteen years. The only disadvantage would be the necessity of removing the loops and constructing the flyovers at a later date if the traffic volumes continue to increase.

VALUE ENGINEERING DESIGN COMMENT # 15

DESCRIPTIVE TITLE OF DESIGN COMMENT:
Make provisions for future Urton Road underpass under I-64

COMMENTARY:

During the information phase of this study, District 5 of KYTC informed the VE team that Jefferson County, KYTC, and local land owners intend to convert North English Station Road and Urton Road into a five-lane road running parallel to I-265 to support and encourage development in the area. As part of this joint participation project, Urton Lane would be straightened and extended to I-64. In an effort to simplify this future project, consideration could be given to making provisions for an Urton Lane underpass under I-64 during the I-64/I-265 interchange reconstruction work. While this would potentially increase the costs of this project, it would save money and time during future work. The idea being that while work is being conducted on I-64 it would be easier to complete as much of the future construction as feasible to avoid unnecessary duplication of work during future projects.

VALUE ENGINEERING DESIGN COMMENT # 16

DESCRIPTIVE TITLE OF DESIGN COMMENT:
Check limits of project included in cost estimate

COMMENTARY:
The cost estimate provided to the VE team does not appear to incorporate costs for reconfiguration work on the supporting roadway network adjacent to the I-64/I-265 and US-60/I-265 interchanges.

There appears to be other disconnects between the construction documents and project cost estimate that could result in unforeseen budgetary problems later in the project. The VE team recognizes that the project is in the schematic design stage and that a more detailed estimate will prepared at a later date. However, for budgetary reasons, a more accurate cost estimate is recommended.

VALUE ENGINEERING DESIGN COMMENT # 17

DESCRIPTIVE TITLE OF DESIGN COMMENT:
Use high mass lighting vs. conventional lighting

COMMENTARY:
Consider partial use of high mast lighting at US-60 interchange. Reduce the number of poles, luminaries, and associated wire, conduit, etc.

VE RECOMMENDATIONS on the I-265 and US 60 Interchange

The following recommendations are focused on the I-265 and US 60 interchange. While a majority of the recommendations concern only this interchange, some recommendations may refer to the I-265 and I-64 interchange or be applicable to that interchange as well. Where appropriate, this is noted in the documentation of the specific recommendations.

VALUE ENGINEERING RECOMMENDATION # 1

PROJECT: I-64 / US-60 & I-265 Interchange Reconstruction Projects
LOCATION: Middletown, KY
STUDY DATE: June 10 – 14, 2002

DESCRIPTIVE TITLE OF RECOMMENDATION:
Construct retaining walls in northwest quadrant of US-60 / I-265 Interchange to reduce ROW

ORIGINAL DESIGN:
The original design approximated the maximum amount of right of way that would possibly be needed for this project by assuming all 6:1 earthwork slopes. Given this assumption, properties in the northwest section of the US-60 / I-265 will have to be acquired.

RECOMMENDED CHANGE:
Construct retaining walls to reduce the amount of right of way needed and avoid the acquisition of the business properties.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$5,000,000		$5,000,000
RECOMMENDED DESIGN	$862,500		$862,500
ESTIMATED SAVINGS OR (COST)	$4,137,500		$4,137,500

VALUE ENGINEERING RECOMMENDATION # 1

ADVANTAGES:

- Reduces the amount of ROW required
- Eliminates requirement for acquisition of commercial properties near interstate

DISADVANTAGES:

- Aesthetical considerations of hard structure versus landscaped slope

JUSTIFICATION:

The retaining wall would perform the same function of the slope at a reduced cost while obtaining the benefits listed above. The issue of aesthetics is a public perception and preference for slopes, however, the retaining wall would not be unsightly given the location of the existing businesses.

VALUE ENGINEERING RECOMMENDATION # 1

DISCUSSION CONTINUED

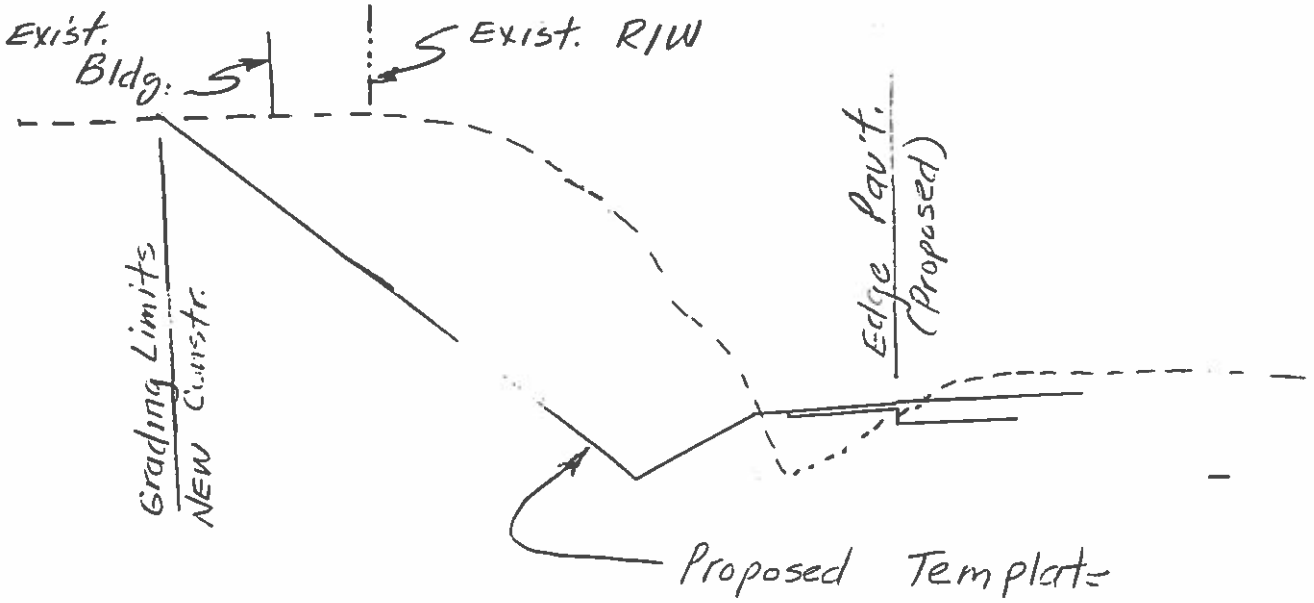
Construction of retaining walls may warrant consideration to reduce impacts to adjacent properties in the vicinity of the I-64 / I-265 interchange as well. In particular, the following areas could be considered for detailed examination.

The north side of I-64 between Stations 465+00 and 490+00. Adjacent residential development would be impacted as currently illustrated. Cost to acquire ROW may justify wall construction or use of steeper slopes if feasible.

Steeper slopes may be considered at several locations along both sides of I-265 between Taylorsville Rd. and I-64. Existing slopes are steeper than 6:1 in most locations.

VALUE ENGINEERING RECOMMENDATION # 1

SKETCH OF ORIGINAL DESIGN

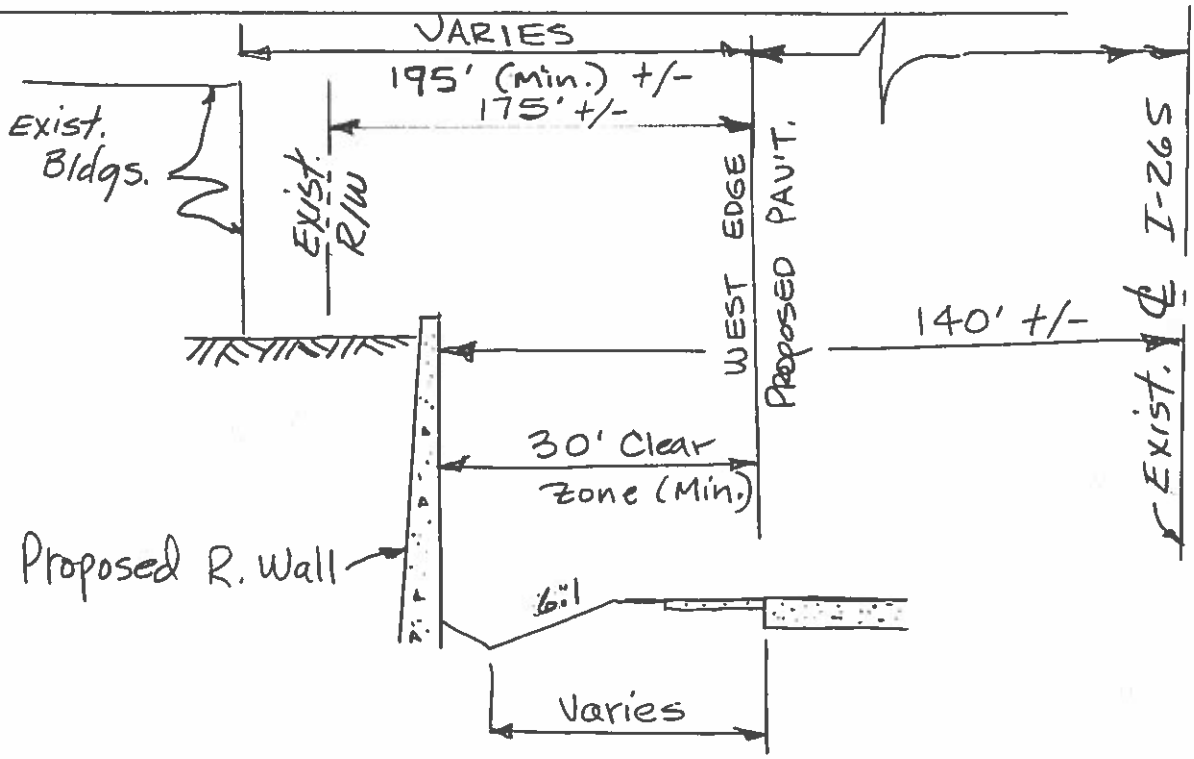


Between 1157+00 and 1163+00 +/-

I-265 (NW QUAD @ US 60 Interchange

VALUE ENGINEERING RECOMMENDATION # 1

SKETCH OF RECOMMENDED DESIGN

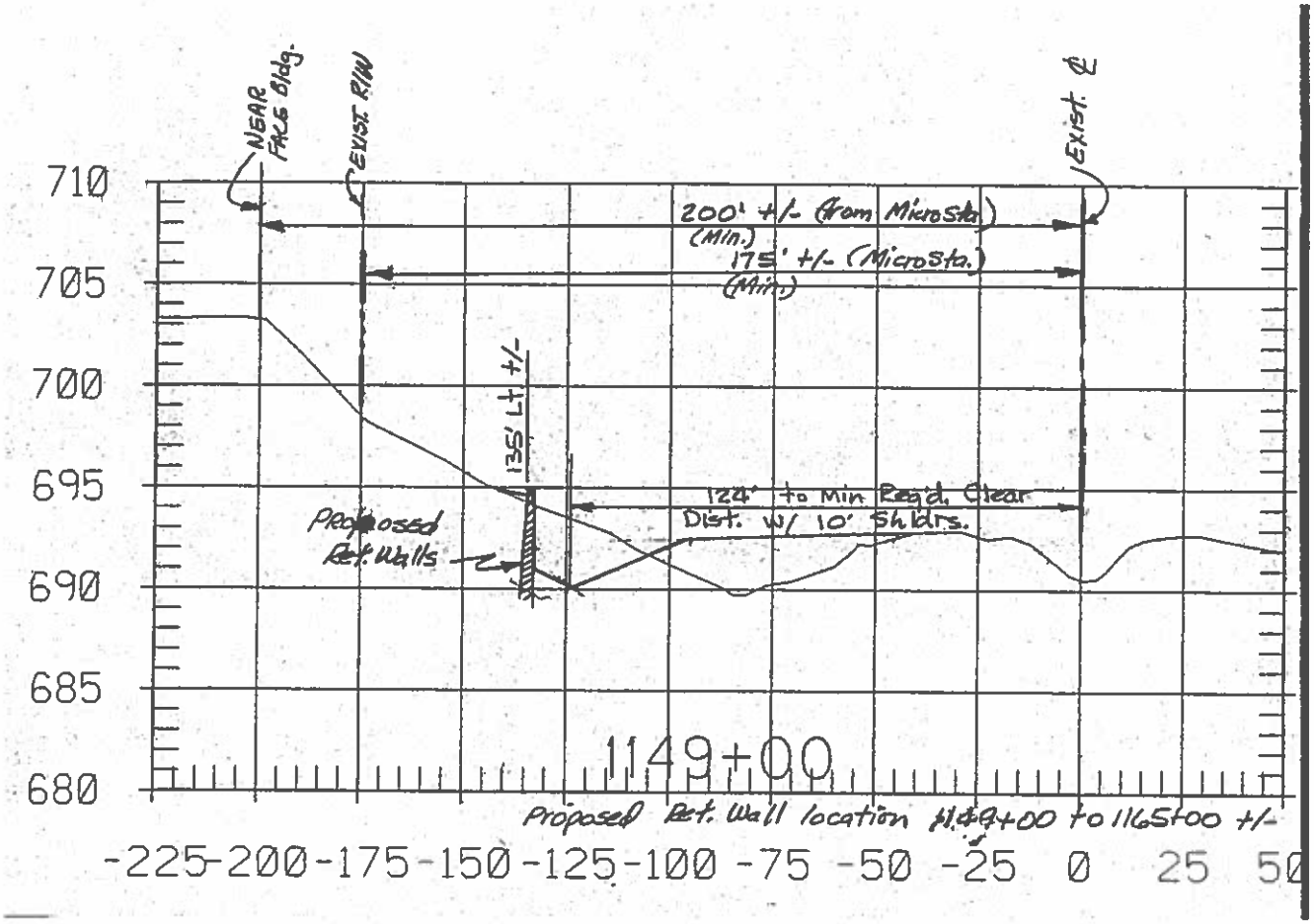


From sta. 1150+00 to 1165+00 I-265
(GENE SNYDER FREEWAY)

Bldgs w/ min. Horizontal Clearance
Are at 1146+00 & 1149+00 +/-

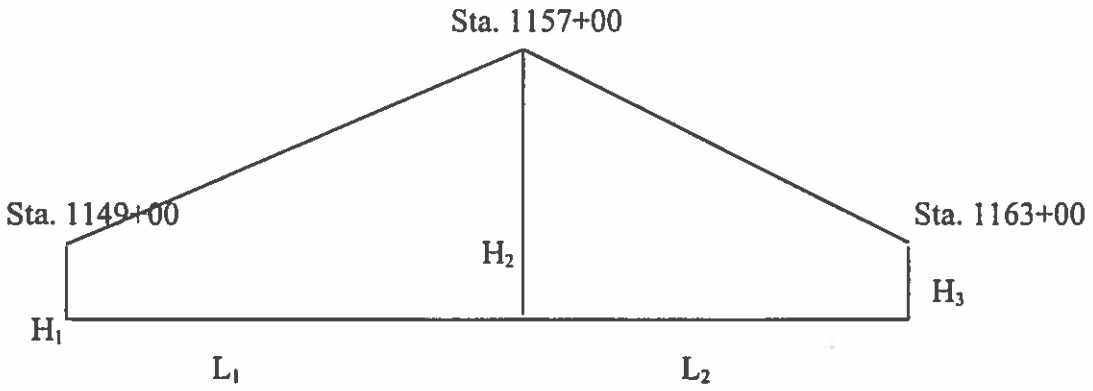
VALUE ENGINEERING RECOMMENDATION # 1

SKETCH OF RECOMMENDED DESIGN



VALUE ENGINEERING RECOMMENDATION # 1

CALCULATIONS



Given:

$H_1 = 15'$ $L_1 = 800$
$H_2 = 20'$ $L_2 = 600$
$H_3 = 10'$

Square Footage of Retaining Wall:

$$\frac{15' + 20'}{2} \times 800 + \frac{20' + 10'}{2} \times 600 = 14{,}000 + 9{,}000 = 23{,}000 \text{ SF}$$

VALUE ENGINEERING RECOMMENDATION # 1

COST ESTIMATE - FIRST COST

Cost Item	Units	$/Unit	Source Code	Original Design		Recommended Design	
				Num of Units	Total $	Num of Units	Total $
ROW	LS				$5,000,000		
Retaining Wall	SF	30.00	8			23,000	$690,000
Subtotal					$5,000,000		$690,000
Mark-up		@	25%				$172,500
Total					$5,000,000		$862,500

SOURCE CODE:
1 Project Cost Estimate
2 CES Data Base
3 CACES Data Base
4 Means Estimating Manual
5 National Construction Estimator
6 Vendor Lit or Quote (list name / details)
7 Professional Experience (List job if applicable)
8 Other Sources (specify)

8 – Bill Hornbeck, $24 / SF inflated to $30 / SF because of height

VALUE ENGINEERING RECOMMENDATION # 2

PROJECT: I-64 / US-60 & I-265 Interchange Reconstruction Projects
LOCATION: Middletown, KY
STUDY DATE: June 10 – 14, 2002

DESCRIPTIVE TITLE OF RECOMMENDATION:
Provide alternative access to Boughman (Money Concepts) development parcels

ORIGINAL DESIGN:
US-60 vertical profile is to be lowered in the vicinity of the access road to developmental property in the southwest quadrant of the US-60 / I-265 interchange. This would require purchasing the property and businesses in the right of way.

RECOMMENDED CHANGE:
Purchase right of way as illustrated on sketch and improve Urton Lane to provide access to developable areas. Do not purchase Thorton Gas Station or strip mall.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$11,570,000		$11,570,000
RECOMMENDED DESIGN	$1,796,580		$1,796,580
ESTIMATED SAVINGS OR (COST)	$9,773,420		$9,773,420

VALUE ENGINEERING RECOMMENDATION # 2

ADVANTAGES:

- Allows for direct access to development parcel
- Reduces amount of right of way required

DISADVANTAGES:

- May infringe upon approach to I-265 southbound from US-60
- May add additional traffic to Urton Lane with associated impacts to existing properties

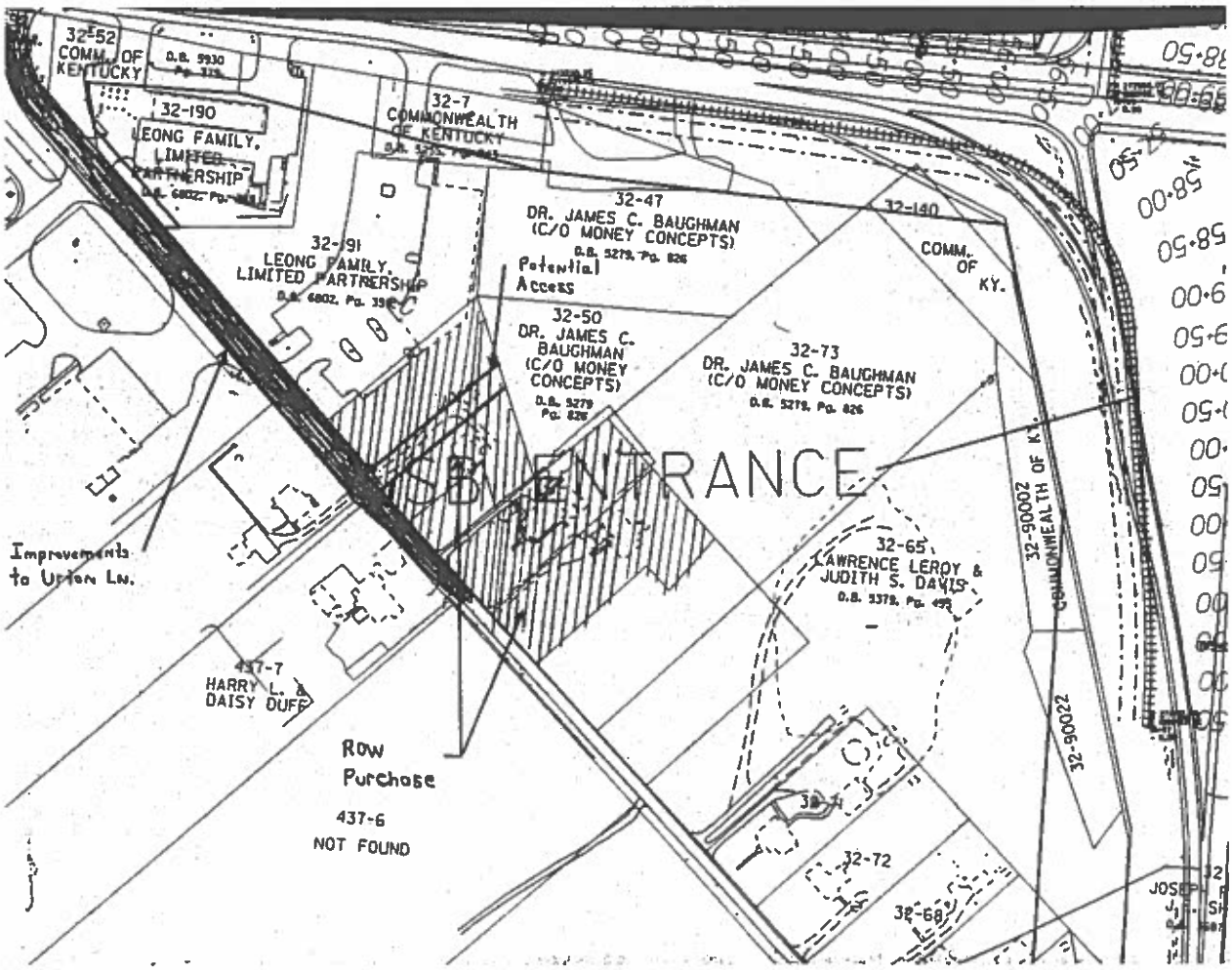
JUSTIFICATION:

Currently, there is direct access from US-60 to the businesses in question. The original design eliminates this access and, thus is requiring the purchase of the businesses. This recommendation provides an alternative access plan to the businesses and, therefore, eliminates the requirement to purchase them.

Note: The cost calculations provided to the VE team indicate that the properties will be purchased. However, the drawings show that the buildings are preserved. Reevaluation of this disconnect needs to be conducted to ensure the viability of this recommendation.

VALUE ENGINEERING RECOMMENDATION # 2

SKETCH OF RECOMMENDED DESIGN



VALUE ENGINEERING RECOMMENDATION # 2

CALCULATIONS

Purchase Right of Way

Assume purchase of 3 residential properties on Urton Lane for access

Property costs = $200,000

Admin and closing costs = $5,000

Relocation assistance = $25,000

Assume 40% mark-up for court costs

Roadway Improvements to Urton Lane

Assume 5 lane section to new access

1000' x 60' = 60,000 ft^2 / 9 = 6,666 SY

6,666 SY x $52 / SY = 346,632

VALUE ENGINEERING RECOMMENDATION # 2

COST ESTIMATE - FIRST COST

Cost Item	Units	$/Unit	Source Code	Original Design		Recommended Design	
				Num of Units	Total $	Num of Units	Total $
Purchase "Money Concepts"	LS				$7,000,000		
Purchase Thortons	LS				$575,000		
Purchase strip mall	LS				$625,000		
Property	Ea	200,000	1			3	$600,000
40% Mark-up					$3,280,000		$240,000
Admin Costs	Ea	5,000	1	3	$15,000	3	$15,000
Relocation Assistance	Ea	25,000	1	3	$75,000	3	$75,000
Subtotal ROW					$11,570,000		$930,000
Urton Lane Improvements	SY	52.00	8			6,666	$346,632
25% Contingency							$86,658
Total Construction							$433,290
Total					$11,570,000		$1,796,580

SOURCE CODE:
1 Project Cost Estimate
2 CES Data Base
3 CACES Data Base
4 Means Estimating Manual
5 National Construction Estimator
6 Vendor Lit or Quote (list name / details)
7 Professional Experience (List job if applicable)
8 Other Sources (specify)

VALUE ENGINEERING RECOMMENDATION # 10

PROJECT: I-64 / US-60 & I-265 Interchange Reconstruction Projects
LOCATION: Middletown, KY
STUDY DATE: June 10 – 14, 2002

DESCRIPTIVE TITLE OF RECOMMENDATION:
Keep existing US-60 interchange and construct an I-265 NB flyover ramp connecting to US-60 WB via Urton Lane

ORIGINAL DESIGN:
The original design calls for the construction of an urban diamond (Single Point Urban Interchange) at the US-60 / I-265 interchange. This would require the complete reconstruction of the interchange. In addition, it appears US-60 will have to be lowered to obtain proper vertical clearance under the increased structure depth of the SPUI structures. (Note: This was not included in the original design cost estimate.)

RECOMMENDED CHANGE:
Utilize the existing interchange by widening US-60 from 6 to 8 lanes. Construct an I-265 northbound flyover ramp to US-60 westbound via Urton Lane. Incorporate signals at the diamond interchange with ITS for mitigation of congestion.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$11,481,216		$11,481,216
RECOMMENDED DESIGN	$11,604,750		$11,604,750
ESTIMATED SAVINGS OR (COST)	($123,534)		($123,534)

VALUE ENGINEERING RECOMMENDATION # 10

ADVANTAGES:

- Removes I-265 northbound to US-60 westbound traffic from interchange
- Utilizes a majority of the existing structures
- New CD bridges will have span length and depth similar to existing structures, thus not requiring excavation and lowering of US-60 under the bridges
- Provides direct access to new hotel/office complex proposed in the SW quadrant of interchange.
- Provides simplified access to businesses in northwest quadrant of interchange

DISADVANTAGES:

- Adds additional signaling requirement through interchange
- Requires four 11' lanes and four 12' lanes versus eight 12' lanes
- Requires purchase of ROW for Urton Lane connection

JUSTIFICATION:

This recommendation provides direct access of I-265 northbound traffic to developed and developing businesses off of North English Station Road and Urton Lane. Additionally, the north to west traffic pattern is removed from the existing interchange, thus relieving some of the traffic congestion in the area.

The existing cost estimate shows sight distance mitigation work on US-60 to the west of the interchange. Should the original design (SPUI) be constructed, US-60 will have to be lowered to obtain proper clearances underneath the new structure. This recommendation eliminates this additional excavation by retaining the existing structures.

This recommendation will provide a comparable level of service for most traffic flow through the interchange and considerably improve the level of service for the northbound to westbound traffic.

VALUE ENGINEERING RECOMMENDATION # 10

CALCULATIONS

New Two-Lane Flyover Ramp:

Approximate Length = 1,200 LF
Cost per LF = $21,645,250[1] / 5200 LF[2] = $4,160 / LF

Widen Existing Structure

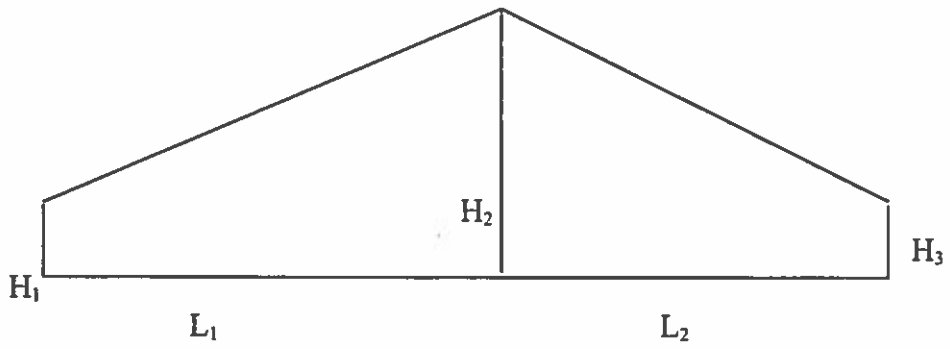
Length = 200 ft
Width = 51 ft
SF = 200' x 51' = 10,200 SF x 2 CD bridges = 20,400 SF

Unit cost for widening = 21,645,000[1] / (5200)(40)[3] = $104 / SF

Notes:

1. Taken from total two-lane flyover cost for I-64 / I-265 flyover ramps
2. Scaled total distance from I-64 / I-265 flyover ramps
3. Total width of I-64 / I-265 flyover ramps

MSE Walls



Given: $H_1 = 4'$ $L_1 = 1000'$
$H_2 = 30'$ $L_2 = 1000'$
$H_3 = 4'$

Square Footage of Retaining Wall:

$$\frac{4' + 30'}{2} \times 1000 \times 2 = 34{,}000 \text{ SF}$$

VALUE ENGINEERING RECOMMENDATION # 10

CALCULATIONS

Replacement of US-60 Main lane

Assume 4,000' total length from North English Station Road to east end of US-60 / I-265 Interchange. Assume 1,000' length for hill excavation.

Original Design

Width of Pavement = 8 lanes x 12' each + 2 x 10' shoulders = 116'

116' x 3,000' = 348,000 SF / 9 = 38,667 SY

Excavation underneath structure to obtain clearance

116' width x 4' height x 1000' length = 464,000 ft^3

= 17,185 CY

Additional Excavation of hill for clearance

Assume hill excavation will be doubled or additional 13,037 CY

Total Excavation Required = 17,185 + 13037 = 30,222 CY

Excavation Cost = $2,172,888 / 373,737 CY = $5.81 say $6.00

Recommended Design

Width of Pavement = 2 lanes x 12' each x 4,000' = 96,000 SF / 9 = 10,700 SY

VALUE ENGINEERING RECOMMENDATION # 10

COST ESTIMATE - FIRST COST

Cost Item	Units	$/Unit	Source Code	Original Design		Recommended Design	
				Num of Units	Total $	Num of Units	Total $
Flyover Ramp Const.							
MSE Wall	SF	30.00	1,8			26,000	$780,000
Roadway Pavement*	SY	52.00	8			8,650	$449,800
Flyover Bridge	SF	4,160.00	8			1,200	$4,992,000
I-265 Mainline Bridge (Org.)	LS				$5,447,957		
Mainline MSE Wall	SF	30.00	1,8	51,500	$1,545,000		
I-265 Mainline Bridge (Rec.)	SF	104.00				20,400	$2,121,600
US-60 Reconstruction	SY	52.00	8	38,667	$2,010,684	10,700	$556,400
Excavation	CY	6.00	1	30,222	$181,332		
Subtotal					$9,184,973		$8,899,800
Mark-up		@	25%		$2,296,243		$2,224,950
ROW	LS		7				$480,000
Total					$11,481,216		$11,604,750

SOURCE CODE:
1 Project Cost Estimate
2 CES Data Base
3 CACES Data Base
4 Means Estimating Manual
5 National Construction Estimator
6 Vendor Lit or Quote (list name / details)
7 Professional Experience (List job if applicable)
8 Other Sources (specify)

*Note: Urton Road Improvements

8 – Bill Hornbeck and Tala Quinic

VALUE ENGINEERING RECOMMENDATION # 12

PROJECT: I-64 / US-60 & I-265 Interchange Reconstruction Projects
LOCATION: Middletown, KY
STUDY DATE: June 10 – 14, 2002

DESCRIPTIVE TITLE OF RECOMMENDATION:
Eliminate sound wall protection on both interchanges

ORIGINAL DESIGN:
The original design includes construction of sound walls to shield local residents from traffic noise.

RECOMMENDED CHANGE:
Eliminate the sound wall protection on both interchanges.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$5,568,000		$5,568,000
RECOMMENDED DESIGN	$0		$0
ESTIMATED SAVINGS OR (COST)	$5,568,000		$5,568,000

VALUE ENGINEERING RECOMMENDATION # 12

ADVANTAGES:

- More aesthetically pleasing right of way to motorists
- Lessens complexity of structures if walls were to be attached to the structures
- Eliminates debate over amount of coverage and design of sound walls

DISADVANTAGES:

- Goes against public preference for noise wall protection
- Eliminates secondary benefit of sound walls (i.e. physical separation of residents from traffic, etc.)

JUSTIFICATION:

Section IV, part B of the Environmental Assessment for this project states that the predicted noise levels for the two interchanges will not be significantly different from a no-build condition. The EA further states that construction of structural noise barriers are not reasonable for either of these two projects.

In addition, properties undeveloped at the time of the public hearing phase are not subject to future noise abatement consideration.

The disconnect between the EA and project documents should be addressed during the preliminary design to avoid misunderstandings during later stages of the design.

VALUE ENGINEERING RECOMMENDATION # 12

COST ESTIMATE - FIRST COST

Cost Item	Units	$/Unit	Source Code	Original Design		Recommended Design	
				Num of Units	Total $	Num of Units	Total $
Sound walls (I-64)	LF	600.00	1	5,209	$3,125,400		
Sound walls (US-60)	LF	600.00	1	2,215	$1,329,000		
Subtotal					$4,454,400		
Mark-up		@	25%		$1,113,600		
Total					$5,568,000		

SOURCE CODE:
1 Project Cost Estimate
2 CES Data Base
3 CACES Data Base
4 Means Estimating Manual
5 National Construction Estimator
6 Vendor Lit or Quote (list name / details)
7 Professional Experience (List job if applicable)
8 Other Sources (specify)

VALUE ENGINEERING DESIGN COMMENT # 3,8

DESCRIPTIVE TITLE OF DESIGN COMMENT:
Sell state-owned excess right of way not necessary for project

COMMENTARY:
The State of Kentucky currently owns real estate in the NW and NE quadrants of the US-60 / I-265 Interchange. The proposed project limits do not require this property for right of way. Given the development potential in this area, consideration could be given to selling the property and funneling the profits to offset the cost of the proposed interchange reconstruction.

VALUE ENGINEERING DESIGN COMMENT # 11

DESCRIPTIVE TITLE OF DESIGN COMMENT:
Control traffic flow on ramps with traffic control signals / ITS system

COMMENTARY:
Many other states have incorporated the use of Intelligent Transportation Systems (ITS) to mitigate congestion in areas of high traffic volumes. The ITS system consists of a series of traffic signals on the ramps controlling the traffic based upon the amount of congestion. The systems have had considerable success in mitigating congestion during times of peak traffic volume. While probably not an acceptable total replacement of interchange reconstruction, these systems could be used as a way of revising Alternate 1 (loop ramps in the east to south and south to east directions) to increase the level of service in the short term and keep the alternate feasible for an increase in traffic volumes in the long term.

VALUE ENGINEERING DESIGN COMMENT # 14

DESCRIPTIVE TITLE OF DESIGN COMMENT:
Use existing shoulder widths on Aiken Road overpass structures

COMMENTARY:
Consider using existing shoulder widths on Aiken Road overpass structures so that they will not require widening as indicated on existing plans

VALUE ENGINEERING DESIGN COMMENT # 15

DESCRIPTIVE TITLE OF DESIGN COMMENT:
Shorten southbound auxiliary lane

COMMENTARY:
Shorten I-265 southbound auxiliary lane to eliminate the need to lengthen the existing culvert in the vicinity of Station 1169 + 00.

APPENDICES

The appendices in this report contain backup information supporting the body of the report, and the mechanics of the workshop. The following appendices are included.

CONTENTS

APPENDIX A
Participants

Workshop Attendance

Attendees				Participation							
				Meetings			Study Sessions				
Name	Organization and Address (Organization first, with complete address underneath)	Tel # and FAX. (Tel first with FAX underneath)	Role in wk shop	Intro	Mid Wk Rev	Out Brief	Day 1	Day 2	Day 3	Day 4	Day 5
Brian Aldridge	HNTB Corporation	502-581-0985	A/E Designer			X					
Ananias Calvin III	Kentucky Transportation Cabinet	502-564-3280	C.O. Design	X							
Larry Chaney	HNTB Corporation	502-581-0985	A/E Designer	X							
Stephen Curless	URS	513-419-3504	Roadway Engr.	X		X	X	X	X	X	X
Jon Cox	URS	513-419-3503	Structural Engr.	X		X	X	X	X	X	X
Joette Fields	Kentucky Transportation Cabinet	502-564-3280	C.O. Design	X		X					X
Steve Goodpaster	Kentucky Transportation Cabinet	502-564-4560	C.O. Bridge Engr.	X							
Shari Greenwell	Kentucky Transportation Cabinet	502-564-4556	C.O. Operations	X							
Jason Hyatt	Kentucky Transportation Cabinet	502-564-3280	C.O. Design			X					
Carl Jenkins	Kentucky Transportation Cabinet	502-458-3432	District 5			X					
Andre Johannes	Kentucky Transportation Cabinet	502-564-3280	C.O. Design			X					
Mike Milligan	Kentucky Transportation Cabinet	502-564-4556	C.O. Operations	X		X	X	X	X	X	X
John Moss	HNTB Corporation	502-581-0985	A/E Designer			X					
Tala Quinio	Kentucky Transportation Cabinet	502-367-6411	District 5 Design	X		X		X	X	X	X
Joshua Rogers	Kentucky Transportation Cabinet	502-569-3280	Central Office			X	X	X	X		X
Robert Semones	Kentucky Transportation Cabinet	502-564-3280	C.O. Design/VE	X		X					X
C.W. Seymour	URS	502-964-5391	Highway Engr.	X		X	X	X	X	X	X

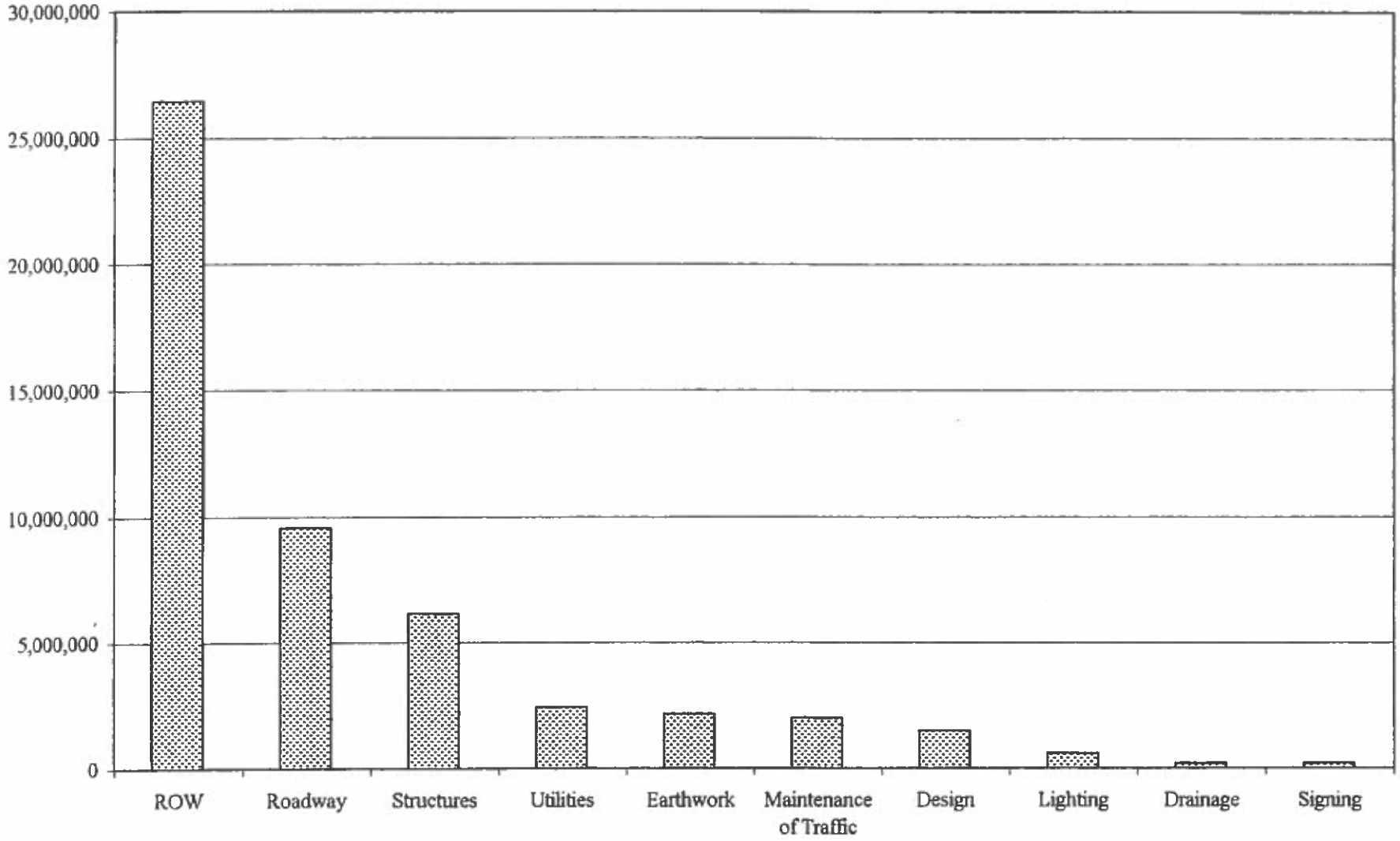
Workshop Attendance

Attendees				Participation							
				Meetings			Study Sessions				
Name	Organization and Address (Organization first, with complete address underneath)	Tel # and FAX. (Tel first with FAX underneath)	Role in wk shop	Intro	Mid Wk Rev	Out Brief	Day 1	Day 2	Day 3	Day 4	Day 5
Siamak Shafaghi	Kentucky Transportation Cabinet	502-564-3280	C.O. Design/VE	X		X					
Gary Sharpe	Kentucky Transportation Cabinet	502-569-3280	C.O. Design Dir.			X					
Kevin Villier	Kentucky Transportation Cabinet	502-367-6411	District 5 Design	X		X					
Joe Waits	URS	251-666-2184	VE Team Leader	X		X	X	X	X	X	X
Mark Watson	URS	913-344-1045	Asst. VE Team Leader	X		X	X	X	X	X	X
Dave Wormald	URS	513-419-3503	Highway Engr.	X		X	X	X	X	X	X

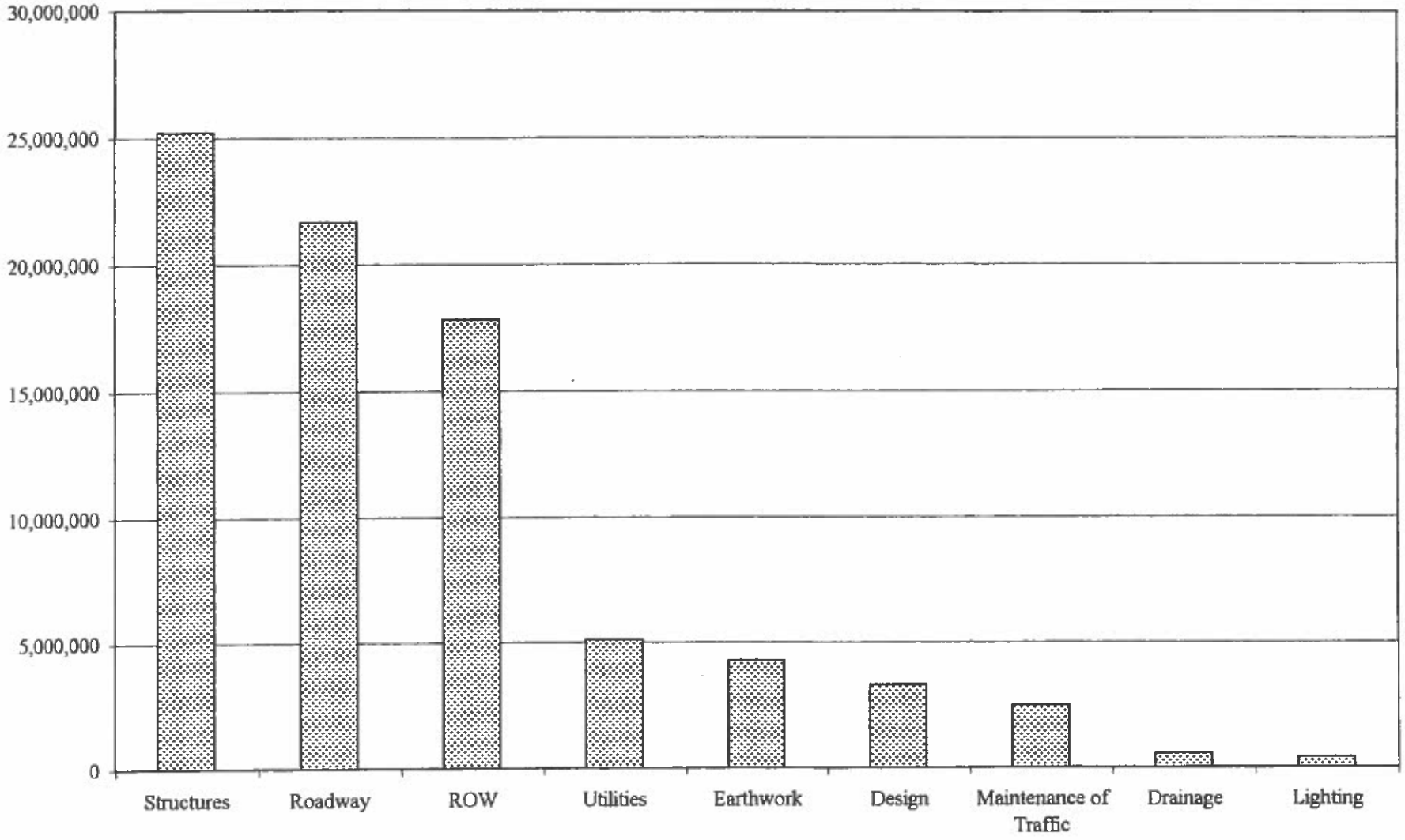
Note: X = Present most of the day. O = Present part of the day. Blank = not present that day.

APPENDIX B
Cost Information

US-60 / I-265 Interchange



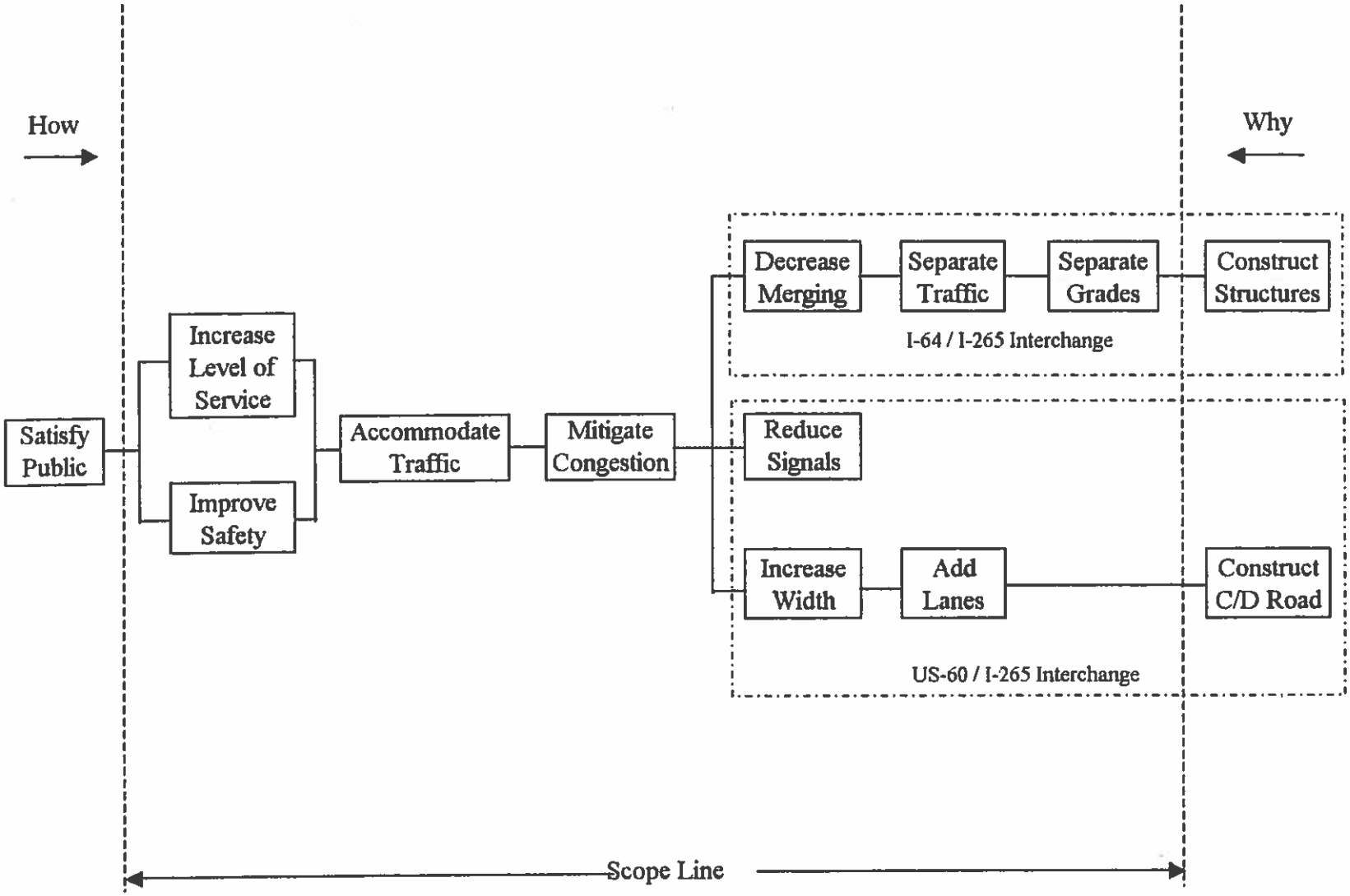
I-64 / I-265 Interchange



APPENDIX C
Function Analysis

FUNCTION ANALYSIS		
The Function Of	**Function**	
	Verb	**Noun**
Utilities	Preserve	Service
	Accommodates	Construction
	Protect	Service
	Enhance	Capacity
Earthwork	Provides	Platform
	Creates	Profile
	Provides	Foundation
	Promotes	Drainage
	Minimize	Structure
	Enhance	Safety
Maintenance of Traffic	Mitigates	Construction
	Provide	Space
	Provide	Access
	Maintain	Flow
	Enhance	Safety
	Satisfy	Public
Lighting	Enhance	Safety
	Illuminate	Roadway
ROW	Create	Space
	Provide	Area
	Accommodate	Slope
	Provide	Grade
	Create	Profile
	Provide	Boundary
	Provide	Access
	Establish	Ownership
Roadway	Provide	Surface
	Enhance	Safety

	Accommodate	Traffic
	Mitigate	Congestion
	Service	Public
	Minimize	Impact
Structures	Eliminate	Intersection
	Separate	Grades
	Maintain	Traffic
	Retain	Soil
	Minimize	Impact
	Span	Obstacles
	Support	Utilities
Drainage	Prevent	Failure
	Enhance	Safety
	Accommodate	Water
	Minimize	Impact
	Control	Water
Signage	Enhance	Safety
	Provide	Information
	Control	Traffic
	Inform	Public


How
Why
Satisfy Public
Increase Level of Service
Improve Safety
Accommodate Traffic
Mitigate Congestion
Decrease Merging
Separate Traffic
Separate Grades
Construct Structures
I-64 / I-265 Interchange
Reduce Signals
Increase Width
Add Lanes
Construct C/D Road
US-60 / I-265 Interchange
Scope Line

APPENDIX D
Creative Idea List and Evaluation

List of CREATIVE IDEAS			
ID #	**Name of Idea / description**	**TM Resp.**	**Develop Status**
	I-64 / I-265 Interchange		
1	Reduce the radius of ramps to compress interchange and reduce right of way	Steve C.	Combine w/ 1, Develop
2	Modify horizontal alignment of interchange		Combine w/ 2
3	Move Pope Lick Road bridge	Mike M.	Develop
4	Realign / adjust horizontal alignment of Pope Lick Road	Dave M.	Develop
5	Modify vertical profile of ramps		Comb. w/ 11
6	Use retaining walls to reduce right of way where feasible	Dave W.	Comb. w/ US-60 #1 Develop
7	Use bituminous/asphalt for paving		Eliminate
8	Construct one lane crossovers	Mark W.	DC
9	Modify alternate 1 to accommodate future cross over construction	Mark W.	DC
10	Add lanes to current configuration		Eliminate
11	Make two ramps underneath current profile		Comb. w/ 5
12	Split longer fly-over sections into two smaller sections		Comb. w/ 1,2
13	Construct collector/distributor roads on I-64 at interchange		Eliminate
14	Construct retaining walls on north side of I-64 east of Blakenbaker Parkway		Eliminate
15	See US 60 #7	Mark W.	DC
16	Check limits of project on cost estimate	Dave W.	DC
17	Make lighting tower lighting vs. mass-type lighting	Dave W.	DC
18	Use 10' shoulders versus 12' shoulders	Mike M.	Develop
	US60 / I-265 Interchange		
1	Construct retaining wall in northwest quadrant to reduce right of way requirements and save commercial establishments	C.W. S.	Develop
2	Provide alternative access to development parcel in SW quadrant	Dave W.	Develop
3	Sell northwest access property	Mark W.	Combine w/ 8, DC
4	Relocate ramp from north bound I-265 to west bound US 60		Eliminate
5	Relocate collector/distributor roads		Eliminate

List of CREATIVE IDEAS			
ID #	**Name of Idea / description**	**TM Resp.**	**Develop Status**
6	Build US-60 Interchange first, detour I-64/I-265 traffic to US 60 interchange during construction, close clover leafs of I-64/I-265 Interchange		Eliminate
7	Make provisions for future Urton Road underpass under I-64		Addressed as I-64 alt.
8	Sell excess property in northeast quadrant		Combine w/ 3
9	Shift I-265 eastward		Eliminate
10	Keep existing US 60 and original diamond interchange and build NW flyover	John C.	Develop
11	Control traffic flow on and off ramps with ITS system / traffic signals	Mark W.	DC
12	Investigate sound wall construction	Dave W.	Develop
13	Use existing shoulder widths on Aiken Road overpass structures	Dave W.	DC
14	Shorten southbound auxiliary lane	Dave W.	DC

END OF REPORT

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