Central Avenue Value Engineering – Alternative Construction Approach Analysis

Balt Value 2 - C5

DEPARTMENT OF CIVIL & ENVIRONMENTAL ENGINEERING

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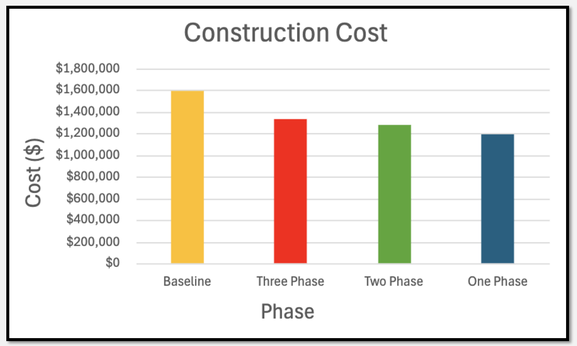
Project Definition

Our project investigates whether alternative construction approaches can provide advantages in terms of cost, time, safety, and public impact compared to an already executed major infrastructure project. Centralized around the intersection of Fleet Street and Central Avenue in Baltimore, MD, our team analyzes the trade-offs between prolonged minor disruptions and shorter, more intensive work occurring in a dense urban setting.

Schedule & Cost Analysis



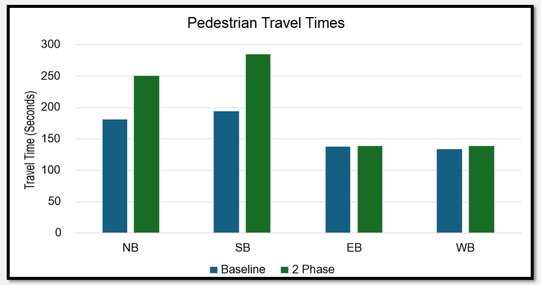
Phase	Cost Reduction - Allan Myers($)	Cost Reduction - Owner ($)	Time Reduction (%)
One Phase	$427,512	$505,000	25.31%
Two Phase	$335,237	$400,000	20.05%
Three Phase	$261,062	$330,000	16.54%

M.O.T. Plans

2 PHASE CONSTRUCTION	Sign Code	Count	Sign Sq. ft.	Sq. ft. Total
Description	Symbol	Central Ave North #1		
2 Miles Ahead to Construction	1A	W16 - 1(3)	4	9	36
Road Work Ahead	2A	W20 - (1)	4	9	36
End Road Work	3A	G20 - 2a	4	8	32
Road Closed	4A	R11 - 2	1	10	10
No Thru Traffic	1B	R10 - 9	1	32	32
Car Detour	2B	M4 -10	8	6	48
Bike Detour	7B	M4 - 9c	8	5	40
No Turn on Red	5B	R10 - 11b	2	4	8
Sidewalk Closed	7C	GM - 2	4	24	96
State Law Stop for Pedestrians	5A	R1-6a	2	3	6
Pedestrian Detour	8B	M4 - 9b	5	7.5	37.5
		Total	43		381.5

	Percent Increase From Baseline Square Footage	Cost Savings From Baseline
1 Phase	269%	$23,500
2 Phase	125%	$15,250
3 Phase	110%	-$3,000

Travel Time



- Northbound: 39% increase from baseline
- Southbound: 47% increase from baseline
- Eastbound: 1% increase from baseline
- Westbound: 4% increase from baseline

VISSIM Simulation

	Percentage Increase From Baseline Travel Time
1 Phase	651%
2 Phase	16%
3 Phase	172%

Pedestrian Concerns

- Engineers from Johnson, Mirmiran & Thompson who commuted through Central Avenue during construction, emphasized how "The M.O.T. prioritized vehicles over pedestrians."
- In response, we added an excess of pedestrian signs to increase driver awareness and to highlight the separation of the work zone boundary.
- Added costs reflected on Allan Myers' updated overhead cost.

Final Design Recommendation

•Our recommended alternative is the **two-phase approach.**

•This alternative provides a time reduction of ~20% and a total cost reduction of $735,237, consisting of $335,237 in the pockets of the General Contractor (Allan Myers) and $400,000 saved on behalf of the owner.

•While the one-phase approach would save more money, travel times increased so much that it disregards property management groups' concerns for unrestricted travel. We deemed the one-phase approach too impractical to be put into practice.

•The two-phase approach maintains easy access for emergency vehicles in the event of an injury on the job site as well as for commuters traveling through the intersection

•Our recommendation can be generalized to other large-scale infrastructure projects where cutting down the number of phases can positively affect project advancement.