

Chapter Nine

Reducing Project Duration

Rationale for Reducing Project Duration

- Time Is Money: Cost-Time Tradeoffs
 - Reducing the time of a critical activity usually incurs additional direct costs.
 - Cost-time solutions focus on reducing (crashing) activities on the critical path to shorten overall duration of the project.
 - Reasons for imposed project duration dates:
 - Time-to-market pressures
 - Unforeseen delays
 - Incentive contracts (bonuses for early completion)
 - Imposed deadlines and contract commitments
 - Overhead and public goodwill costs
 - Pressure to move resources to other projects

Options for Accelerating Project Completion

- Resources *Not* Constrained

- Adding resources
- Outsourcing project work
- Scheduling overtime
- Establishing a core project team
- Do it twice—fast and then correctly

- Resources Constrained

- Improving project team efficiency
- Fast-tracking
- Critical-chain
- Reducing project scope
- Compromise quality



Reducing Project Duration to Reduce Project Cost

Identifying direct costs to reduce project time

→ Gather information about direct and indirect costs of specific project durations

→ Search critical activities for lowest direct-cost activities to shorten project duration

→ Compute total costs for specific durations and compare to benefits of reducing project time

Explanation of Project Costs

- Project Indirect Costs
 - Costs that cannot be associated with any particular work package or project activity
 - Supervision, administration, consultants, and interest
 - Costs that vary (increase) with time
 - Reducing project time directly reduces indirect costs
- Project Direct Costs
 - Normal costs that can be assigned directly to a specific work package or project activity
 - Labor, materials, equipment, and subcontractors
 - Crashing activities increases direct costs.

Project Cost–Duration Graph

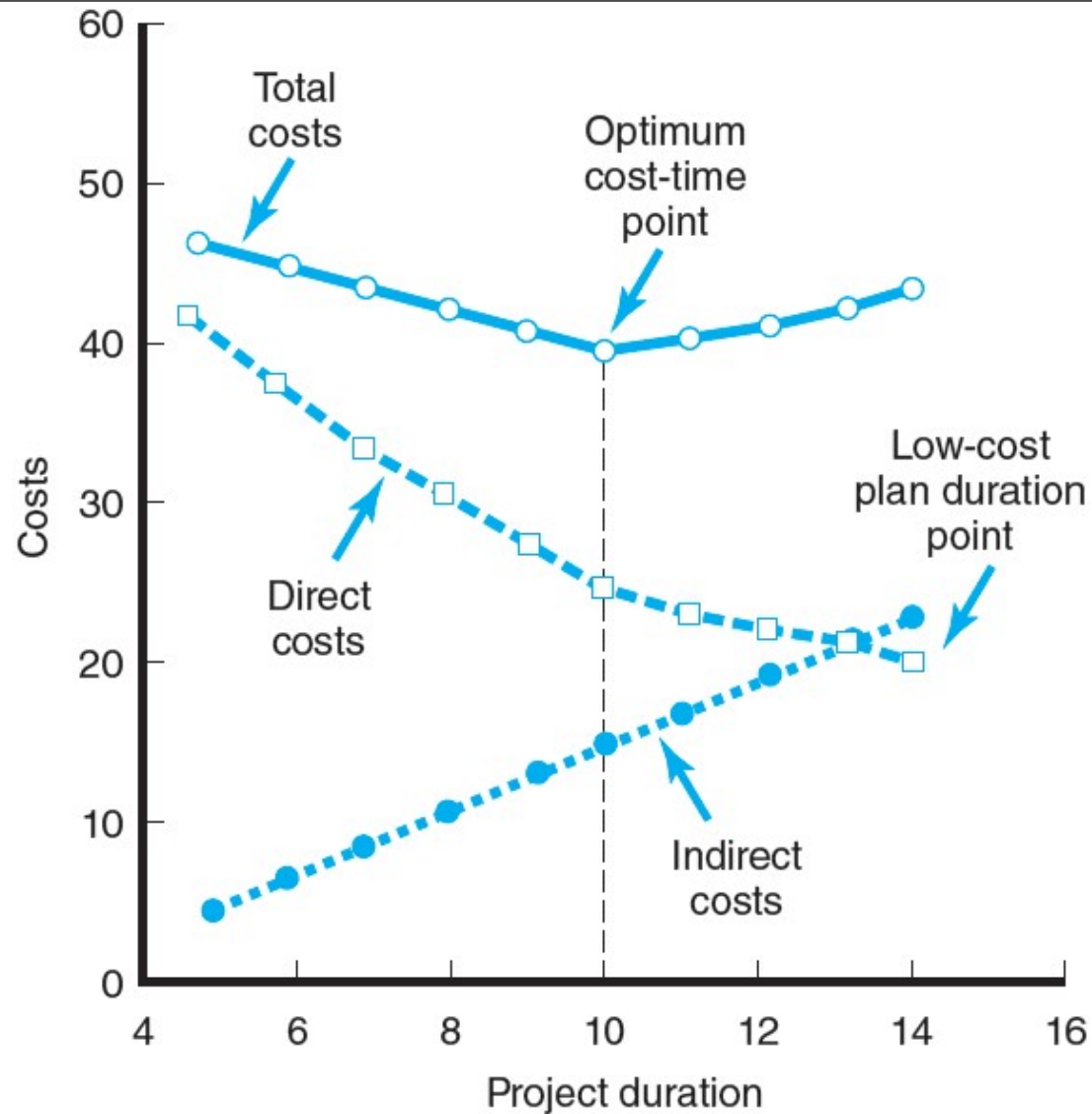


FIGURE 9.1

Constructing a Project Cost–Duration Graph

- Find total direct costs for selected project durations
- Find total indirect costs for selected project durations
- Sum direct and indirect costs for these selected project durations
- Compare additional cost alternatives for benefits



Constructing a Project Cost–Duration Graph

- Determining Activities to Shorten
 - Shorten the activities with the *smallest increase in cost per unit of time*
 - Assumptions:
 - The cost-time relationship is linear.
 - Normal time assumes low-cost, efficient methods to complete the activity.
 - Crash time represents a limit—the greatest time reduction possible under realistic conditions.
 - Slope represents a constant cost per unit of time.
 - All accelerations must occur within the normal and crash times.

Activity Graph

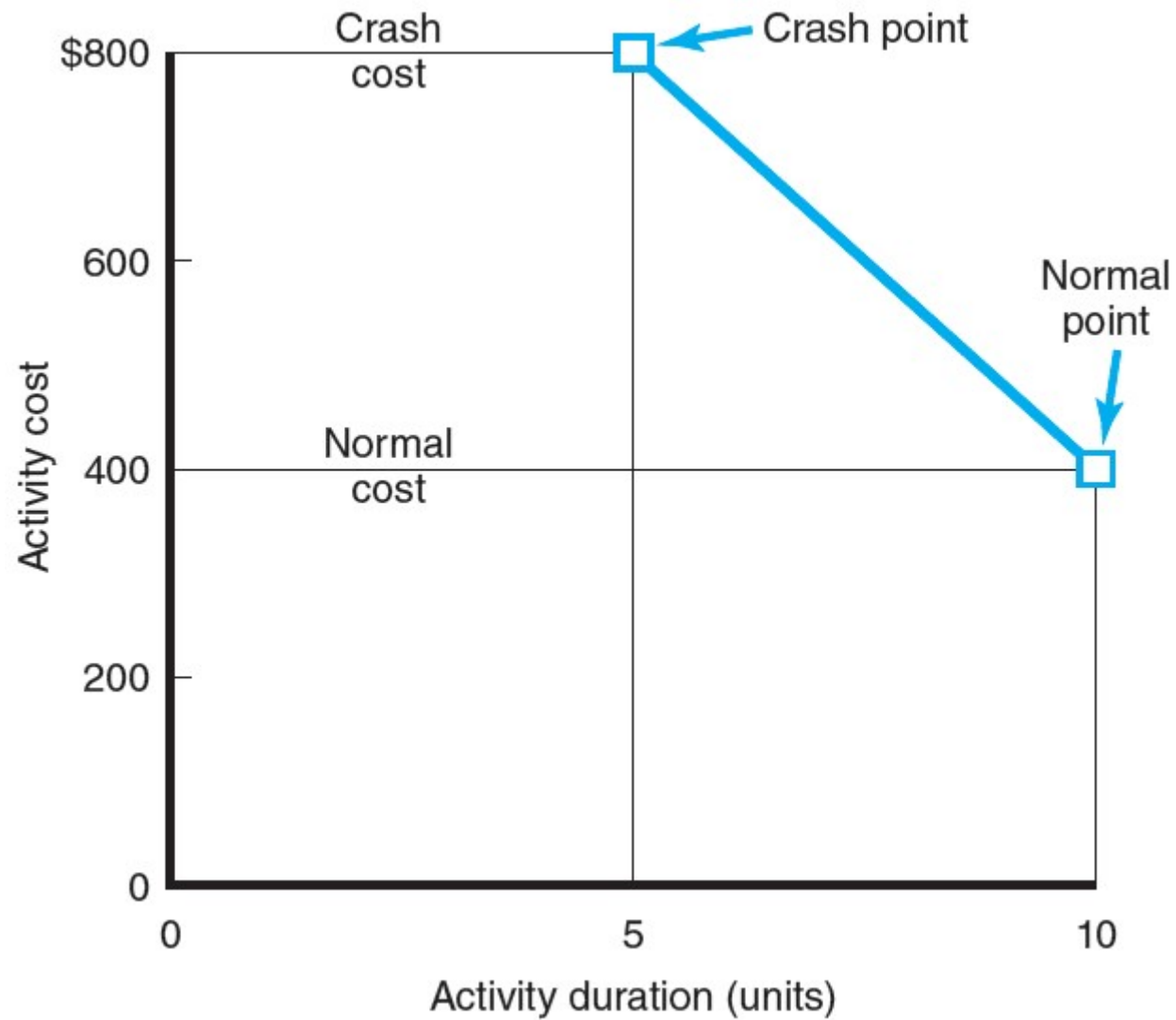


FIGURE 9.2

Cost–Duration Trade-off Example

Activity ID	Slope	Maximum crash time	Direct costs			
			Normal		Crash	
			Time	Cost	Time	Cost
A	<u>\$20</u>	<u>1</u>	3	\$50	2	\$70
B	<u>40</u>	<u>2</u>	6	80	4	160
C	<u>30</u>	<u>1</u>	10	60	9	90
D	<u>25</u>	<u>4</u>	11	50	7	150
E	<u>30</u>	<u>2</u>	8	100	6	160
F	<u>30</u>	<u>1</u>	5	40	4	70
G	<u>0</u>	<u>0</u>	6	70	6	70

FIGURE 9.3

Cost–Duration Trade-off Example (cont'd)

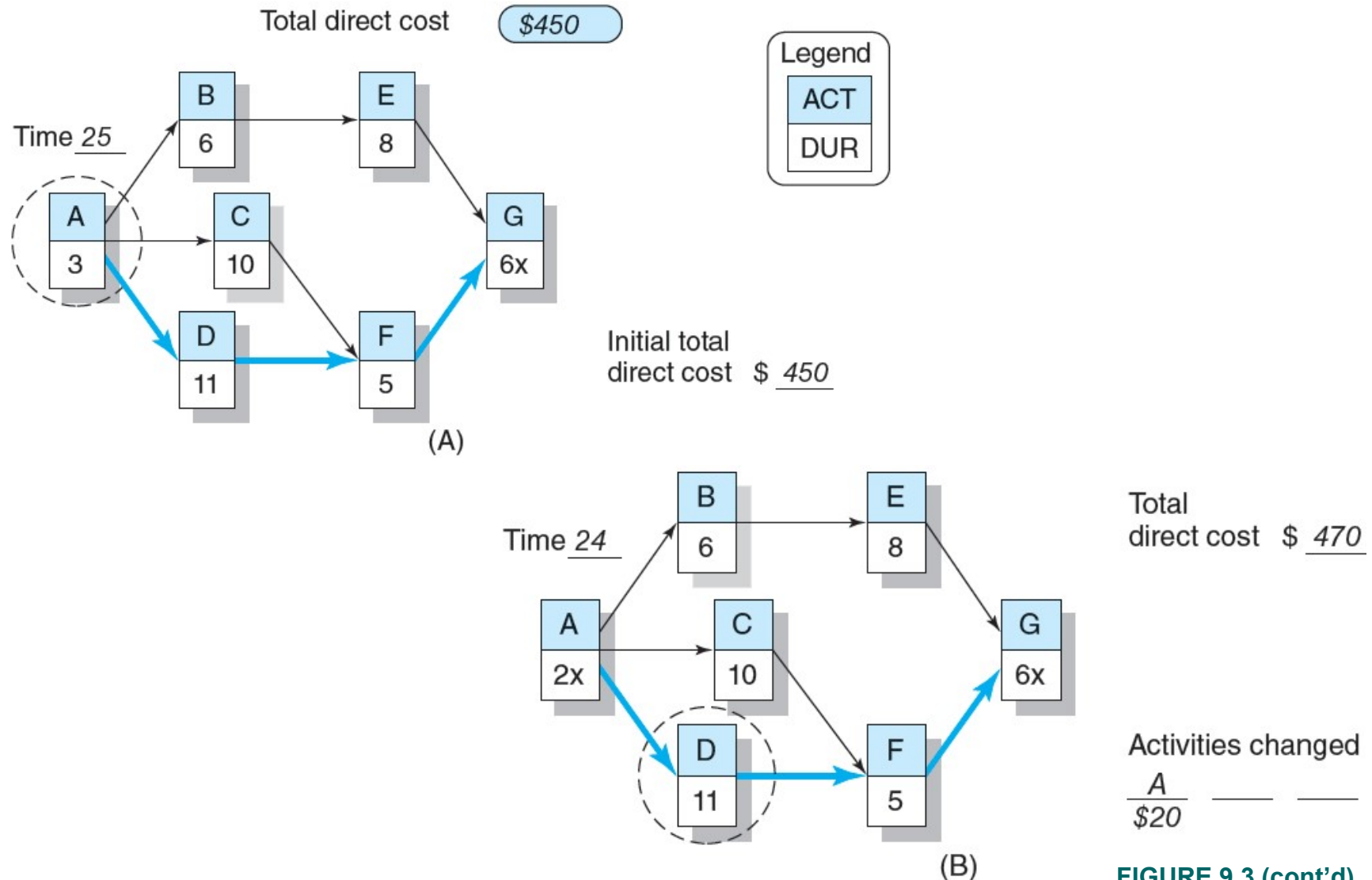


FIGURE 9.3 (cont'd)

Cost–Duration Trade-off Example (cont'd)

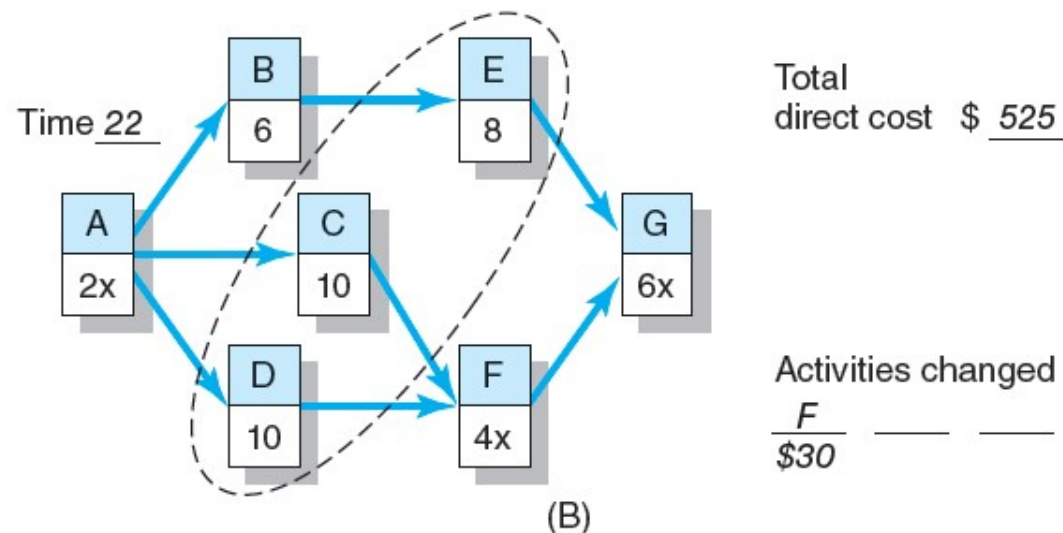
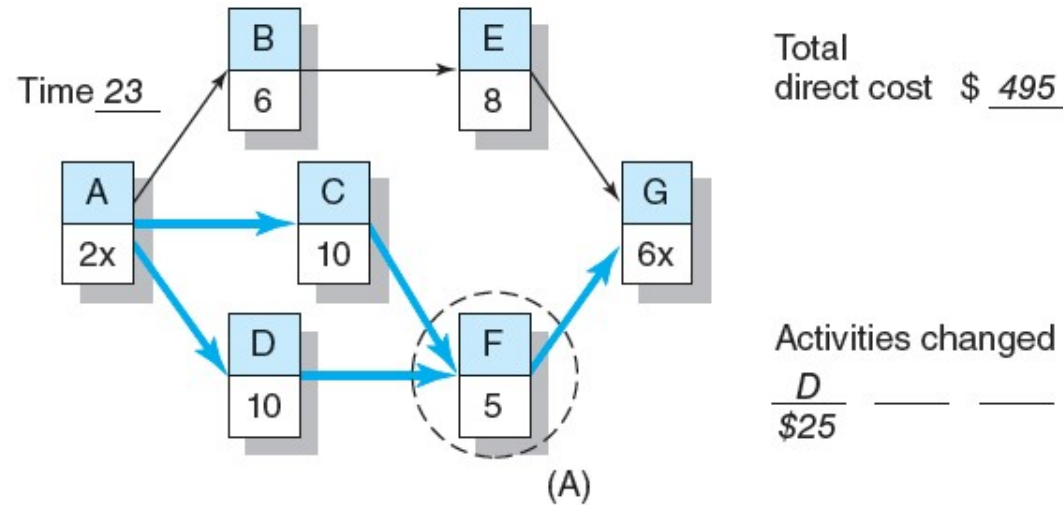


FIGURE 9.4

Cost–Duration Trade-off Example (cont'd)

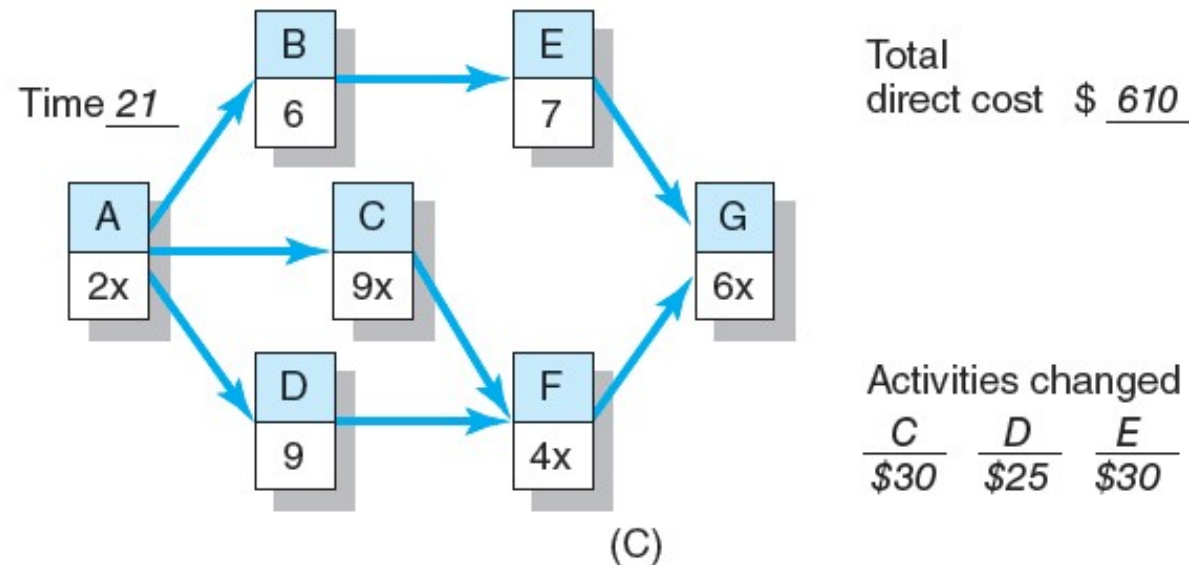


FIGURE 9.4 (cont'd)

Summary Costs by Duration

Project duration	Direct costs	+	Indirect costs	=	Total costs
25	450		400		\$850
24	470		350		820
23	495		300		795
22	525		250		775
21	610		200		810

FIGURE 9.5

Project Cost–Duration Graph

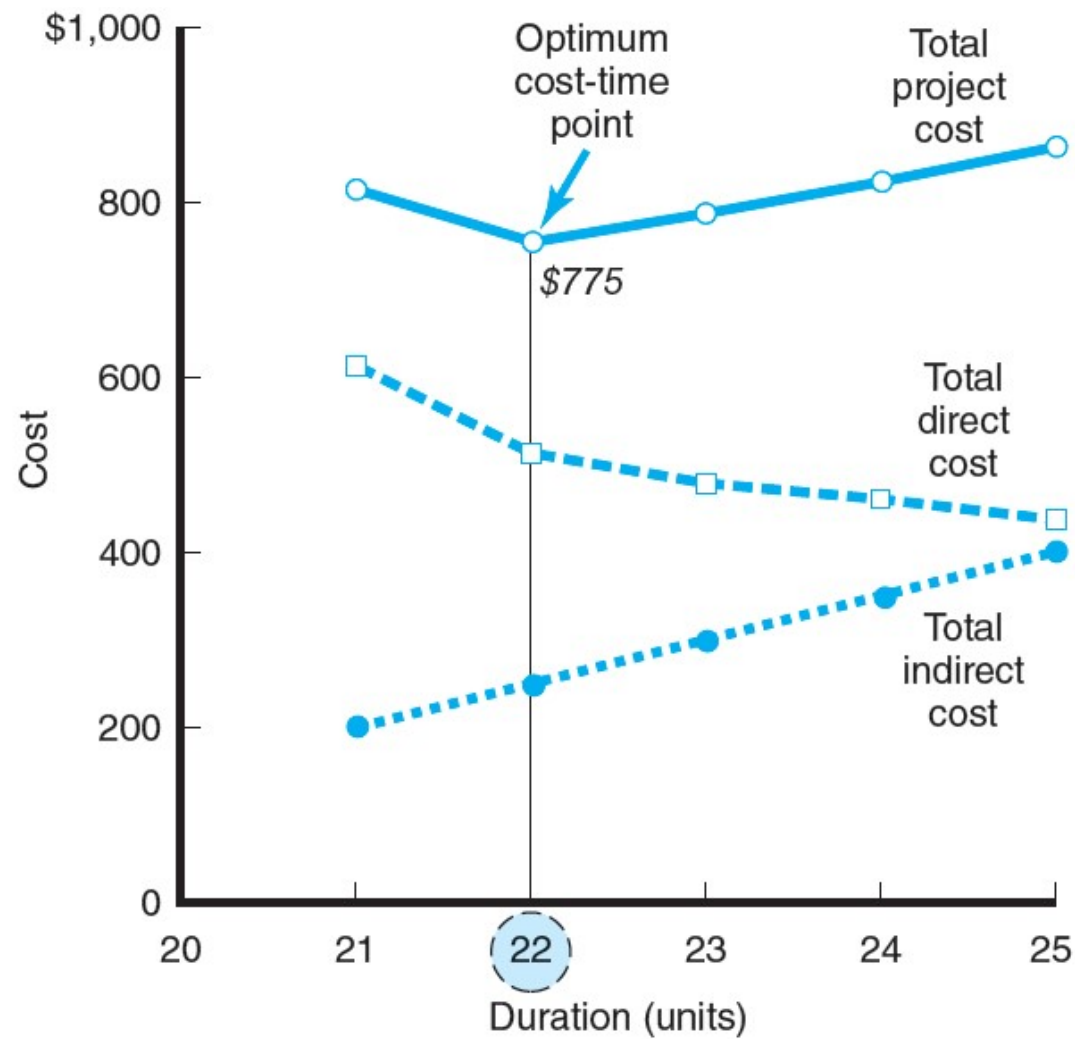


FIGURE 9.6

What if Cost, Not Time Is the Issue?

- Commonly Used Options for Cutting Costs
 - Reducing project scope
 - Having owner take on more responsibility
 - Outsourcing project activities or even the entire project
 - Brainstorming cost savings options