

# C times

## Key points

- Perform an activity on less time is more expensive
- Only make sense to reduce the time for the critical activities since they are the ones that may reduce the total time for the project

Activity	Predecessor	Time	Minimum time	Cost	Increase per unit of time	Daily cost	New daily cost	New activity cost	Total increment
A	-	3	3	\$ 30,000	-		-	-	-
B	-	5	4	\$ 100,000	% 70	\$ 20,000	\$ 34,000	\$ 136,000	\$ 36,000
C	A, B	7	5	\$ 77,000	% 80	\$ 11,000	\$ 19,800	\$ 118,800	\$ 41,800
D	A, B	4	4	\$ 100,000	% 80		-	-	-
E	C	3	3	\$ 45,000	-		-	-	-
F	D	6	4	\$ 72,000	% 75		-	-	-
G	E, F	2	2	\$ 30,000	-		-	-	-
H	E, F	7	5	\$ 98,000	% 80	\$ 14,000	\$ 25,200	\$ 151,200	\$ 53,200

- *Daily cost:*  
 $\text{Cost} / \text{Time}$
- *New daily cost:*  
 $\text{Cost} * (\text{Increase per unit time} / 100 + 1)$
- *New activity cost:*  
 $\text{New daily cost} * \text{Time} - (\text{Amount of days to reduce})$
- *Total increment:*  
 $\text{New activity cost} - \text{Original costs}$

The critical activity with the least **Total Increment** should be chose for decrement one day in

**Original total time:** 23 days

**Original total cost:** \$ 552,000

**Total time after reducing one day: 22 days**

**Total cost for reducing one day: \$ 588,000**

**Total times after reducing two days: 21 days**

**Total cost for reducing two days: \$ 625,400**

Activity	Predecessor	Time	Minimum time	Cost	Increase per unit of time	Daily cost	New daily cost	New activity cost	Total increment
A	-	3	3	\$ 30,000	-		-	-	-
B	-	4	3	\$ 136,000	70	\$ 34,000	\$ 57800	\$ 173,400	\$ 37,400
C	A, B	7	5	\$ 77,000	80	\$ 11,000	\$ 19,800	\$ 118,800	\$ 41,800
D	A, B	4	4	\$ 100,000	80		-	-	-
E	C	3	3	\$ 45,000	-		-	-	-
F	D	6	4	\$ 72,000	75		-	-	-
G	E, F	2	2	\$ 30,000	-		-	-	-
H	E, F	7	5	\$ 98,000	80	\$ 14,000	\$ 25,200	\$ 151,200	\$ 53,200

## Multiple critical paths example:

```
Critical paths = {
    {B, C, E, H},
    {B, D, F, H}
}
```

If there are two critical paths, you have to:

1. Check for the cost on activities on both critical paths (B, H) Because if a day is reduced in any of these activities, both critical paths are benefited
2. Check on all the possible combinations for activities exclusive for each path {(C + D), (C + F), (E + D), (E + F)} Because if two activities, one exclusive of each path, are reduced, then the time for both paths are benefited again

*Note: multiple critical paths are an often pattern*