

20th Annual National Tribal Transportation Conference

Project Scheduling

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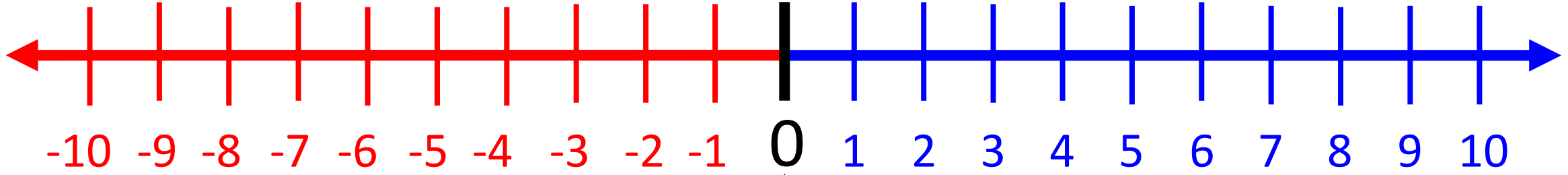
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What is a schedule?

- A tool.....a project management tool
- What is happening?, When?, In what order? For how long?
(**sequence, duration**)
- It is unique to a **project**
- It is visual.

Schedule (from the dictionary)

- a plan of procedure, usually written, for a proposed objective, especially with reference to the sequence of and time allotted for each item or operation necessary to its completion
- a series of things to be done or of events to occur at or during a particular time or period
- a timetable



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ORIGIN



Negative Numbers



Positive Numbers

Schedule Exercise

- Make a simple schedule using a number line.

Look at some design schedules

- How intricate does a schedule have to be? How many activities should be shown?
- This is a matter of personal preference
- Sometimes too much detail can be confusing. I like simplicity.
- *(show 3 design schedules, each one increasing in complexity. Then, show the DOT boilerplate schedule)*

Schedule Characteristics

- Activities/ tasks
- Start and end dates
- Durations
- sequence
- Predecessors
- Graphical representation
- Shows interrelations of tasks

Why do we create schedules?

- To keep everything from happening at once.
- To keep everything happening at the right time.
- Ordering materials-long lead items
- Resource allocation
- A “to-do list”
- Communication tool- “why is it taking so long to get **NTP** to contractor?”
- A tool for managing construction contracts/ claims
 - Item 646(1) CPM Scheduling, who is responsible for “change in contract time”

Design/ construction projects are complex.

- Schedules offer visual representation of this complexity
- They make the complexity easier to understand

Both Design and Construction Projects are a process

- The design process is fairly similar on all jobs. (even though the final work product, the design, is unique)
- In federally funded road projects, the process is dictated by law, by FHWA.
- At Alaska DOT we use the “Alaska Preconstruction Manual”
- Similar to the “Tribal Transportation Program Delivery Guide-2017”
- The schedule follows that process.
- Although construction projects are unique, they also follow a consistent process.

Schedules describe a process

- Planning (TTP)
- Design
- Construction

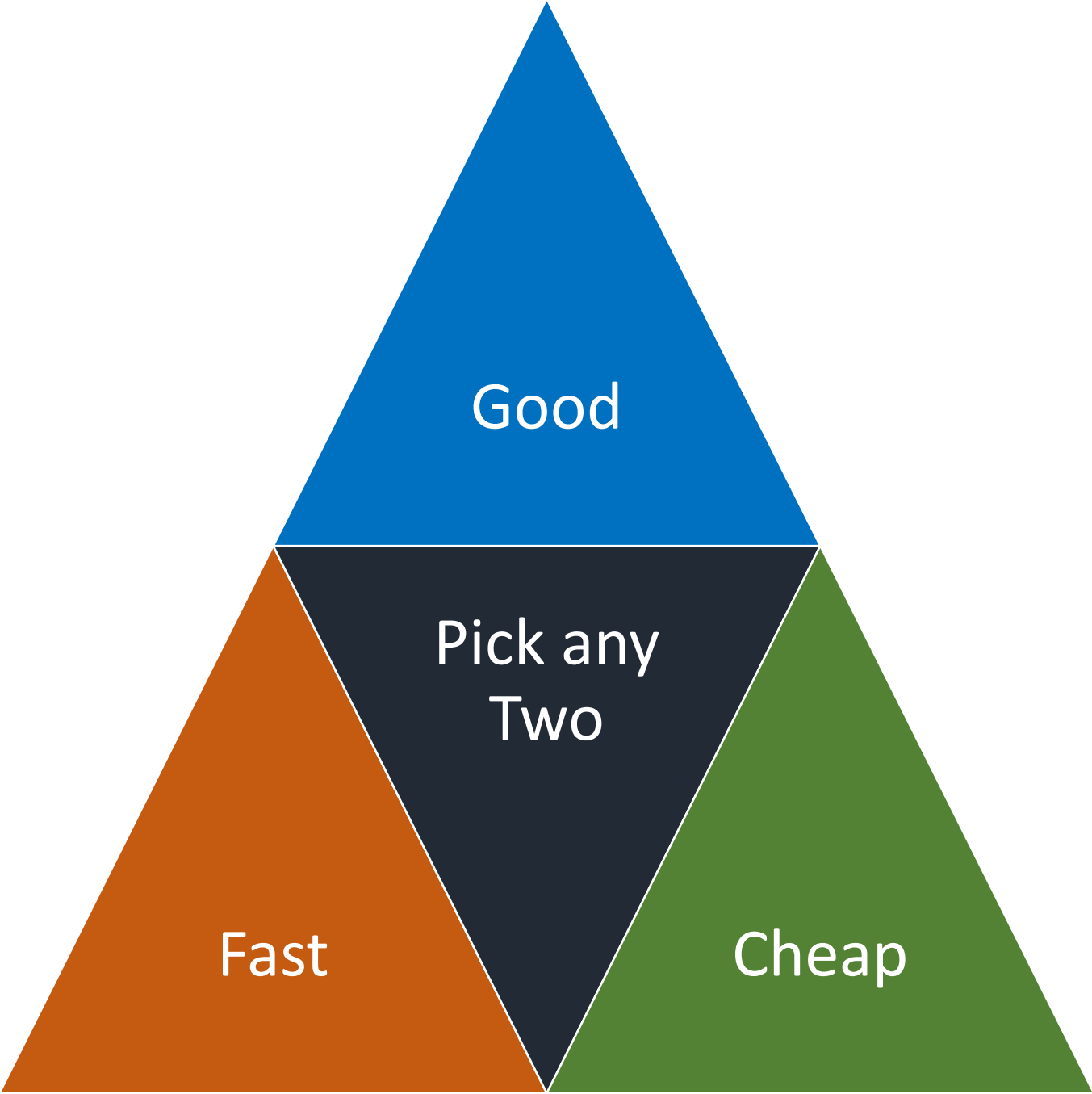
- *Create a planning/design/construction Gantt chart*

- Bureaucratic Process

Look at “Contract Award
Process” Gant Chart

The “Triple Constraint”

- Schedule
- **Budget**
- Quality
-this is an “optimization problem”



What does it cost?

- This is the most important and fundamental question one can ask regarding a construction project.

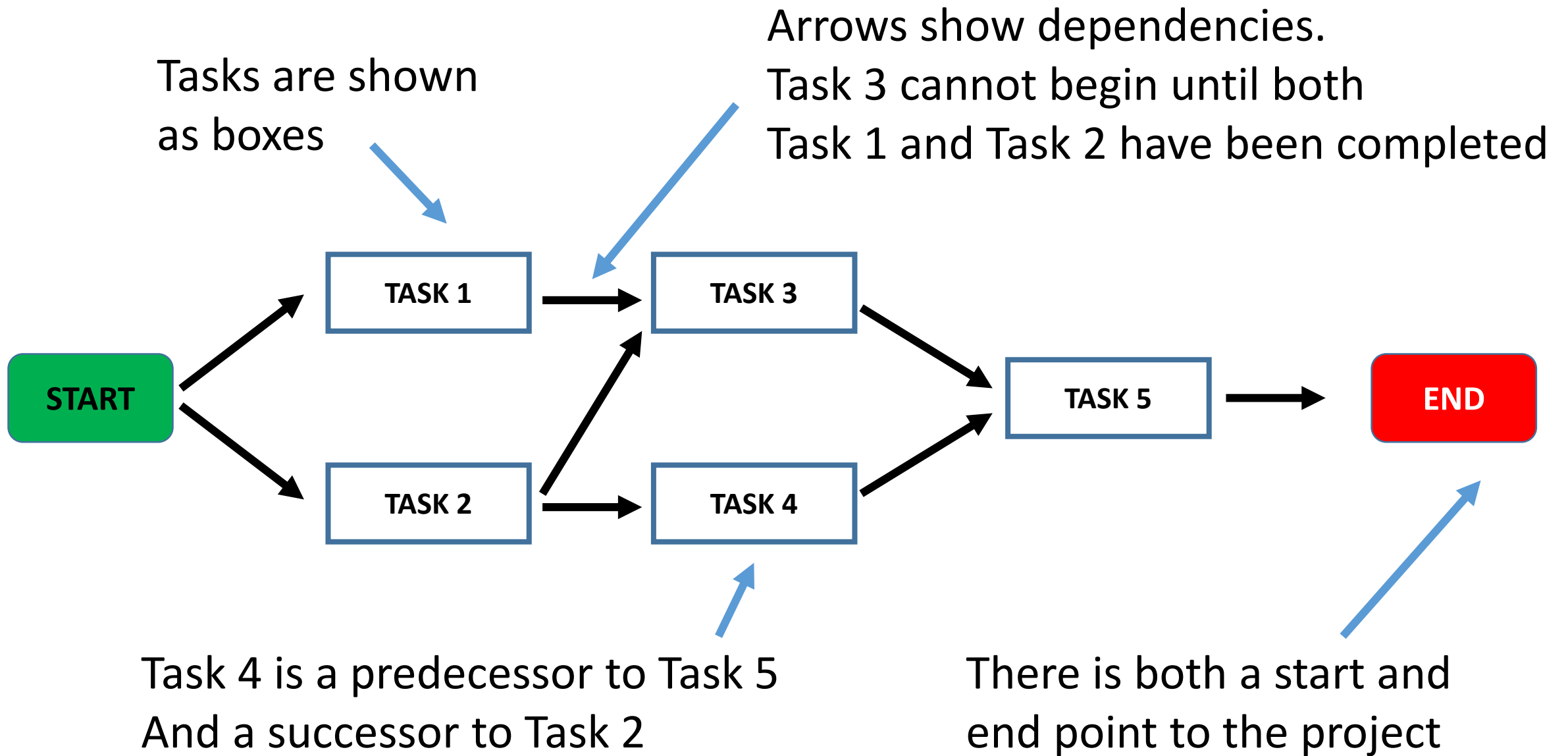
How long will it take?

- This question is equally important.
- Essentially the same question as “what does it cost?”
- Consider the time value of money.
- Consider the opportunity cost of equipment.

What forms do a schedule take?

- Flow Chart
- Is a flow Chart a schedule?

- Work Breakdown Structure
- Activity on Node
- Activity on Line
- Gantt Chart (baseline, float, today line)
- Microsoft project



Making a schedule....step by step..

- 1) make a list of everything that needs to be done....**tasks**
- 2) This list may, or may not be assembled into a **work breakdown structure**
- 3) Arrange the tasks in a logical **chronological** order.

.....Many of these tasks can be performed **concurrently**, while others form a **critical path**.....

- 4) **Estimate** how long it will take to perform each task.
- 5) **Constrain** the tasks with calendar dates.

Critical Path Method, “CPM”

- The critical path is the longest sequence of activities in a project plan which must be completed on time for the project to complete on due date. An activity on the critical path cannot be started until its **predecessor activity** is complete; if it is delayed for a day, the entire project will be delayed for a day.
- *Look at “road design project C” Gantt chart....identify non critical path items, slack time/ float*
- *Look at my critical path Gantt chart*

How long will an activity take?

- This is difficult to calculate
- Judgement and experience
- Tally hours spent on similar projects from payroll records
- Keep records of previous projects
- Guess?....
- Look at my “Galena permitting timeline”

Schedules require upkeep/ maintenance

- We are not profits
- We can not predict the future
- Many aspects of a schedule cannot be accurately predicted (**intangible**)
 - Example: permits

Natural Schedule Constraints

- Freeze up
 - Spring break up
 - Winter
 - Ground water fluctuations
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- What natural schedule constraints are there in the SW?

Regulatory Schedule Constraints

- Bird nesting window
- Fish habitat permit “low water buffer”
- Corps permits-only mine above water, no dredging
- SWPPP-clearing constraints on frozen ground

Galena Road schedule scenarios