

Schedule Density

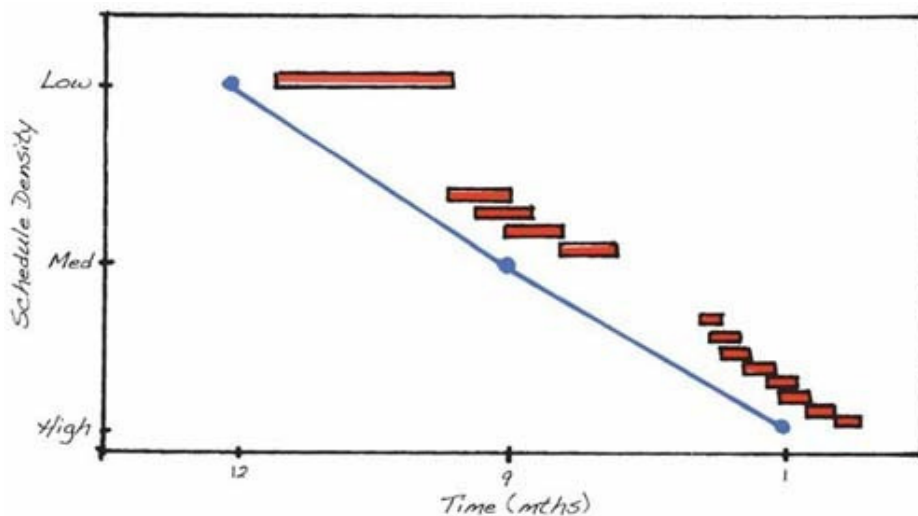
Developing an effective schedule for a complex project is an art. The schedule has to be an effective communication medium at many different levels:

- Communicating strategy and the overall concepts of the project to senior management (ideally on one page)
- Providing direction to managers within the project on what's required of their section (eg, design or procurement)
- Coordinating issues between sections
- Providing details of the work to be done this week by maybe 2000+ people.

The *Guide to Good Practice in the Effective Management of Time in Complex Construction Projects*¹ (**The Guide**) invokes two concepts to achieve this task. The use of Schedule Levels and the use of Schedule Density (Schedule Levels are discussed in our Scheduling White Paper² of the same name).

Schedule Density

The concept of *schedule density* contained in **The Guide** is not dissimilar to *rolling wave* planning³ but has far more practical advice. The concept is based on the idea that it is practically impossible to fully detail a schedule for a complex project at 'day 1' – too many factors are unknown or still to be developed. **The Guide's** advice is to plan the overall project at *Low Density*, expand the work for the next year to *Medium Density* and then expand the next 3 months at *High Density*.



Schedule Density Over Time

The concept of *schedule density* includes:

- Initially the overall project is planned at *Low Density*; this schedule defines the long-term strategic commitments of the project. *Low Density* activities may be several months in duration. Work more than 12 months in the future is retained at *Low Density*.
- Work planned to occur within the next year or so is scheduled at *Medium Density*. This level of expansion defines the tactical approach to achieving the overall strategy set out in the *Low Density*

¹ See: http://www.mosaicprojects.com.au/Books.html#CIOB_Guide

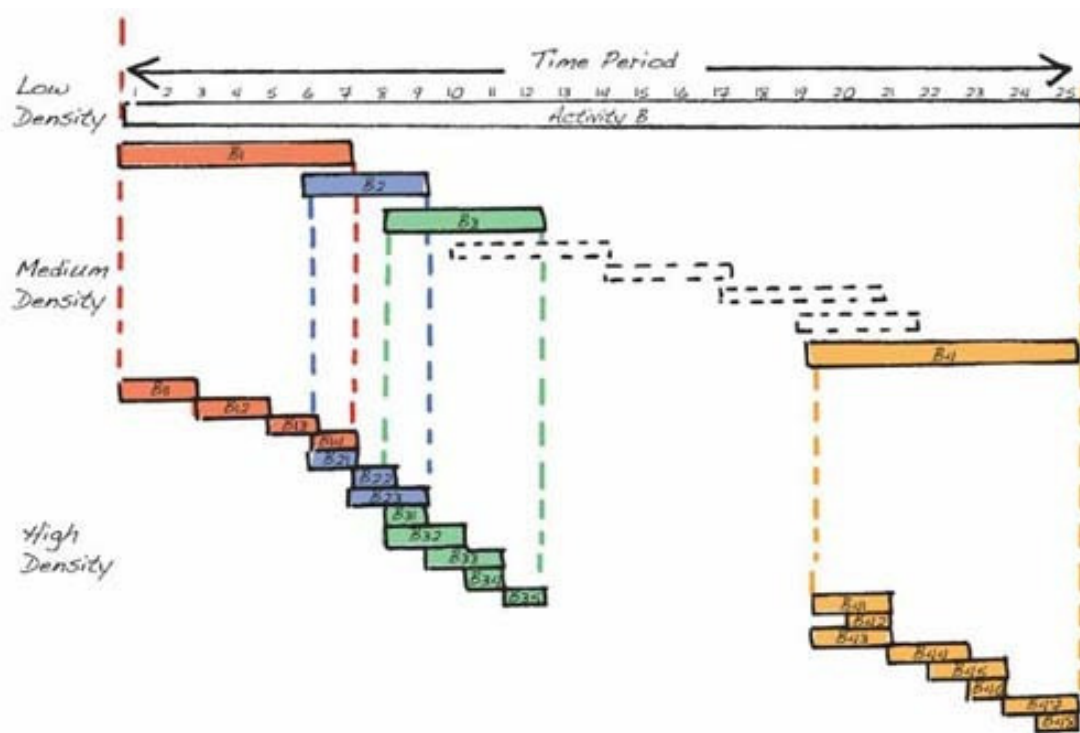
² For more on Schedule Levels see: http://www.mosaicprojects.com.au/PDF/Schedule_Levels.pdf

³ For more on rolling wave see: http://www.mosaicprojects.com.au/WhitePapers/WP1060_Rolling_Wave.pdf

schedule. *Medium Density* activities are no longer than 2 months and focused on one type of work in one specific location.

- Work planned to occur in the next 3 months is scheduled at *High Density* and defines in detail who will be doing what, where and when. *High Density* activities are fully resourced, with a planned duration⁴ no longer than the schedule update period and with specific workers (resources) allocated and the activity durations and sequences based on actual quantities, team sizes, production levels and agreed workflows.

As the *density* of the schedule is increased, at each stage, the plan takes into account the current status of the work, current production rates and what is required to achieve the overall objective of the project defined by the *Low Density* schedule. This approach has a range of advantages over more traditional ways of scheduling not the least of which is engaging the people who will be responsible for doing the work in the next 2 to 3 months in the detailed planning of ‘their work’ and allowing a practical consideration of schedule compression options⁵ as work proceeds.



Activities are expanded to increase density

The schedule levels defined in *The Guide* are generally aligned with long established practices pioneered by Bechtel, Fluor and other major contractors. However, *The Guide* expands the concept of schedule levels to potentially aligned to a WBS⁶

Designing a Schedule Structure

Melding these two ideas into a plan for the management of schedules on a major project is not so straightforward, particularly once the role of individual contractors is taken into account. The diagram below,

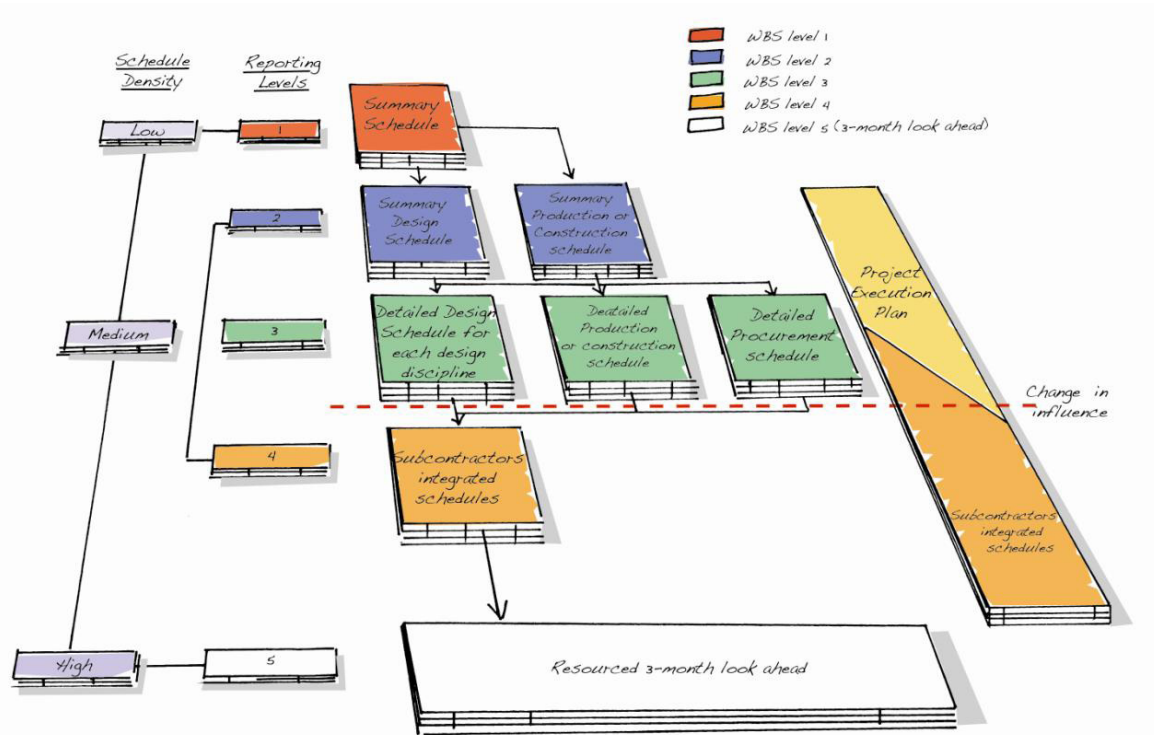
⁴ For more on estimating durations see: http://www.mosaicprojects.com.au/WhitePapers/WP1052_Time_Estimating.pdf

⁵ For more on Schedule Compression see: http://www.mosaicprojects.com.au/WhitePapers/WP1059_Schedule_Compression.pdf

⁶ For more on WBS see: http://www.mosaicprojects.com.au/WhitePapers/WP1011_WBS.pdf

Figure 11 in *The Guide*, shows one possible solution. Using dynamic linking between the different schedules in the coloured boxes the intent of both levels and density can be accommodated.

The core philosophy contained in *The Guide* is to change the project schedule from a static tool used as evidence in disputes after the event to a proactive management tool focused on achieving the best possible time for completion of the project. Which was after all, the reason CIOB started on this task and why many volunteers from around the world have been happy to contribute time and resources.



CIOB Schedule Levels / WBS

Even if you are not in the construction industry, *The Guide* will be a valuable resource for anyone involved in scheduling major projects.

Mosaic’s Scheduling Core Papers

#1	A Guide to Scheduling Good Practice	http://www.mosaicprojects.com.au/PDF/Good_Scheduling_Practice.pdf
#2	Attributes of a Scheduler	http://www.mosaicprojects.com.au/PDF/Attributes_of_a_Scheduler.pdf
#3	Dynamic Scheduling	http://www.mosaicprojects.com.au/PDF/dynamic_scheduling.pdf
#4	Links, Lags & Ladders	http://www.mosaicprojects.com.au/PDF/Links_Lags_Ladders.pdf
#5	Schedule Float	http://www.mosaicprojects.com.au/PDF/Schedule_Float.pdf
#6	Schedule Levels	http://www.mosaicprojects.com.au/PDF/Schedule_Levels.pdf

Mosaic’s Scheduling Home Page is at : <http://www.mosaicprojects.com.au/Planning.html>