

# Establish the Project Schedule

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# Session Objectives

- To define and describe:
  - The need for planning and scheduling
  - Planning -v- scheduling
  - The project scheduler
  - Planning the project
  - Planning the schedule
  - Planning the schedule management
  - Validating the schedule
  - Communication

# The need for Planning and Scheduling

- Projects fail when support of key stakeholders is withdrawn. It may be because the project:
  - Has gone over time and budget
  - The deliverables are no longer needed by the organisation
  - Stakeholders believe that the project did not deliver what they expected

For more on Stakeholder Management see -  
[www.stakeholder-management.com](http://www.stakeholder-management.com)

# The need for Planning and Scheduling

- Factors for Project Success:
  - Skilled PM and team:
    - Knowledge, skills and experience
    - The ‘right’ PM tools, processes and methodologies
  - Project stakeholders managed:
    - Expectations and/or perceptions identified and managed
    - Involvement sought as necessary
  - Timely management of risk (threats & opportunities)
  - Alignment of outcomes to organisation strategy
- Appropriate & effective, planning & scheduling assists all of the above!!

# The need for Planning and Scheduling

- Effective communication is the key
- The schedule is a vital communication medium
- Understand your audiences, their needs are different
  - Team members & contractors
  - Senior managers & clients

For more on communication see - *Communication in organisations: making the schedule effective*: [http://www.mosaicprojects.com.au/Resources\\_Papers\\_090.html](http://www.mosaicprojects.com.au/Resources_Papers_090.html)

# The need for Planning and Scheduling

- Schedules are useful in two key areas:
- The schedule's primary purpose is communication not control
  - Documents cannot 'control' anything
  - They can influence decisions and actions
- An effective schedule also highlights key decisions and the opportune time to make the decision

# Simple -v- Complex Projects

- Research shows scheduling makes little difference to successful time outcomes on simple projects
- **But it is critical to successful time outcomes on complex projects**
- The form of contract used and penalty clauses make no difference!

See: *Managing the Risk of Delayed Completion in the 21st Century*-  
[www.mosaicprojects.com.au/PDF/CIOB\\_TM\\_report\\_full.pdf1](http://www.mosaicprojects.com.au/PDF/CIOB_TM_report_full.pdf1)

# Planning -v- Scheduling

- Planning = Deciding the optimum strategy for the work of the project
- Scheduling = transferring the planning decisions into a time management tool for use in managing the work
- Planning is done before scheduling starts!

See: *WP1038 Project Strategy* -  
[www.mosaicprojects.com.au/WhitePapers/WP1038\\_Strategy.pdf](http://www.mosaicprojects.com.au/WhitePapers/WP1038_Strategy.pdf)

# The Project Scheduler

- Role of the planner / scheduler
  - Know planning theory and practice
  - Help key stakeholders develop ‘their’ schedule
  - Identify issues for management resolution
  - Maintain integrity of the data
  - Ensure management ‘owns’ the schedule!

See: *The Roles and Attributes of a Scheduler* -  
[www.mosaicprojects.com.au/PDF/Attributes\\_of\\_a\\_Scheduler.pdf](http://www.mosaicprojects.com.au/PDF/Attributes_of_a_Scheduler.pdf)

# The Project Scheduler

- Schedulers are not PMs
- Good schedulers are great communicators:
  - Great listeners - to hear what's meant
  - Great questioners - to help others develop their opinions
- Their primary role is communicating to influence others

See - Project management vs Project scheduling

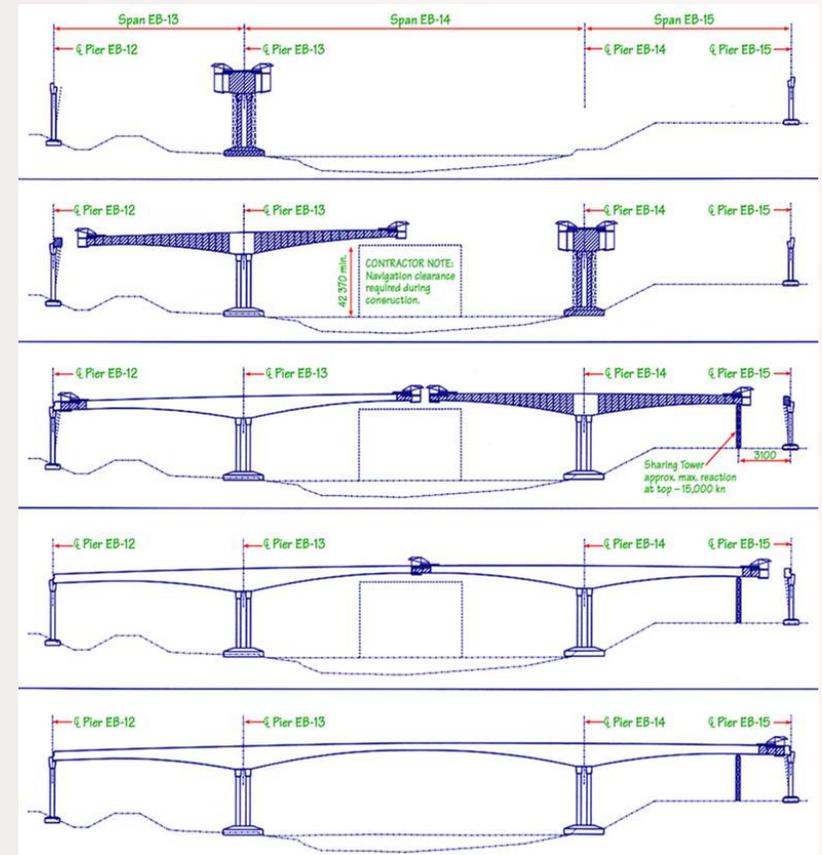
[http://www.mosaicprojects.com.au/Resources\\_Papers\\_107.html](http://www.mosaicprojects.com.au/Resources_Papers_107.html)

# The Project Scheduler

- A good scheduler will:
  - Provide scheduling expertise and run the scheduling tool
  - Develop and maintain an effective schedule for the project manager
  - Gather data and distribute information & reports
  - Provide guidance and coaching to the team

# Planning the Project

- Planning is a management team process
- Requires experience and imagination
- Balances options to optimise all aspects of the work



Is it best to build this bridge one side at a time or both sides simultaneously?

# Planning the Project

- Planning decisions may include:
  - Defining the overall strategy for the work
  - Procurement options
  - Control processes
  - Work areas / zones of operations
  - Phases / stages / gateways
  - Risk optimisation
  - Resource capacity and constraints

See: *WP1039 Project Planning* -

[www.mosaicprojects.com.au/WhitePapers/WP1039\\_Project\\_Planning.pdf](http://www.mosaicprojects.com.au/WhitePapers/WP1039_Project_Planning.pdf)

# Planning the Schedule

- Key schedule design questions:
  - Who needs what information?
    - Defines the codes and reports
  - Determine the project update cycle?
    - Defines acceptable range for activity durations
  - Rolling wave / Schedule density?
    - Plan what you know & evolve the schedule as knowledge increases
  - Schedule levels?
    - Constrains the network size

# Planning the Schedule

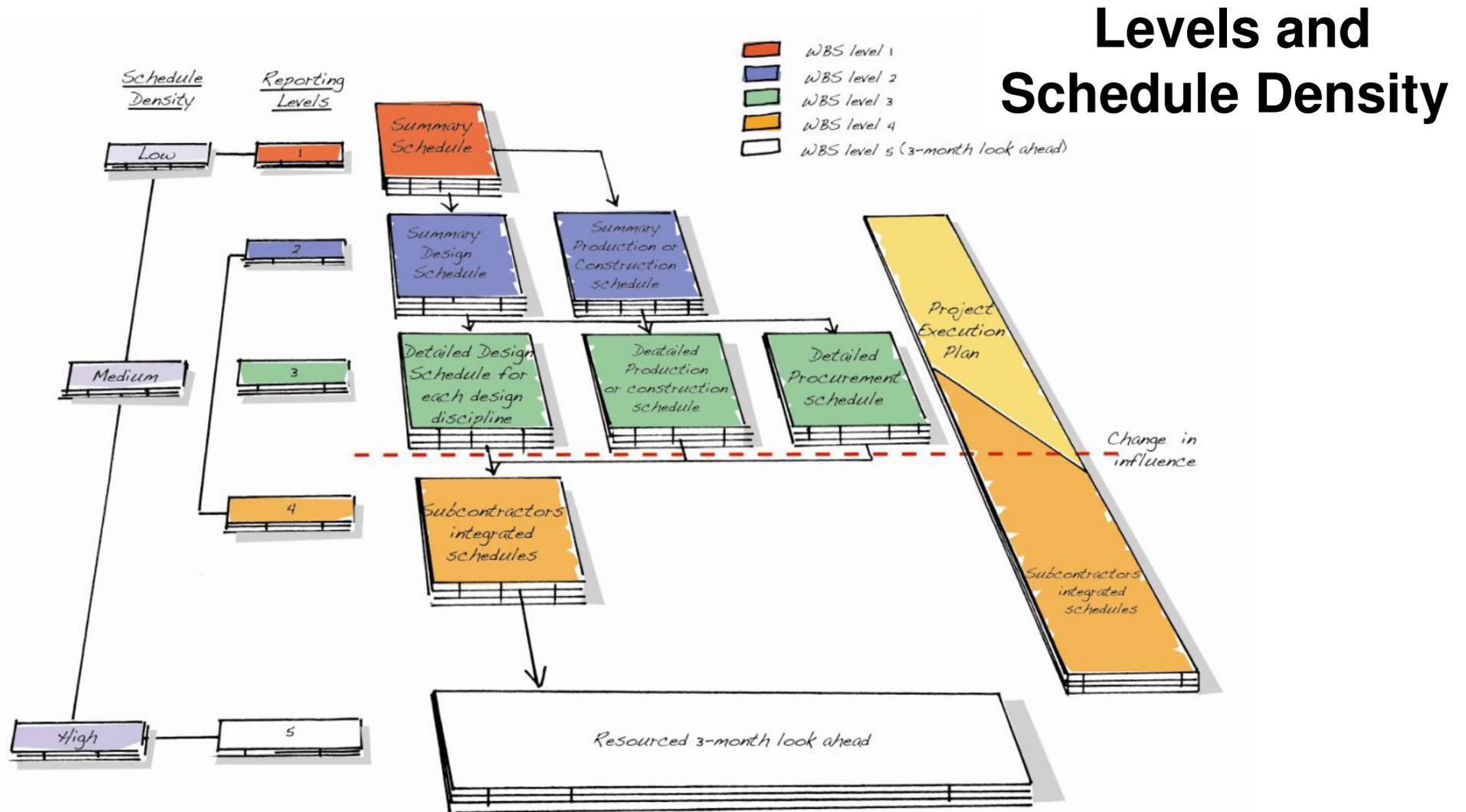
- Understand your audience – different people need different views of the schedule (information to action)
  - Senior management & clients
    - Will the objectives be achieved?
  - Project management
    - What are the issues and problems?
  - Team leaders
    - What do I need to do next?

# Schedule Heuristics

- Some general rules for a usable schedule are:
  - Max length of Critical Path  $\pm 25$  activities
  - Percentage of critical activities  $< 20\%$
  - Max # tasks  $< 600$
  - Link density  $> 1.1$  and  $< 1.5$  for normal work
- Remember management and team members need to understand it!
- Use schedule levels to keep control

# Schedule Levels

Figure © Guide to Good Practice in the Management of Time in Complex Projects



# The Project Update Cycle

- Activity durations =  $< 2 \times$  the Update cycle
- Cycle too short =
  - complex overly large schedules
  - Too many changes for the project team
  - Difficult to manage

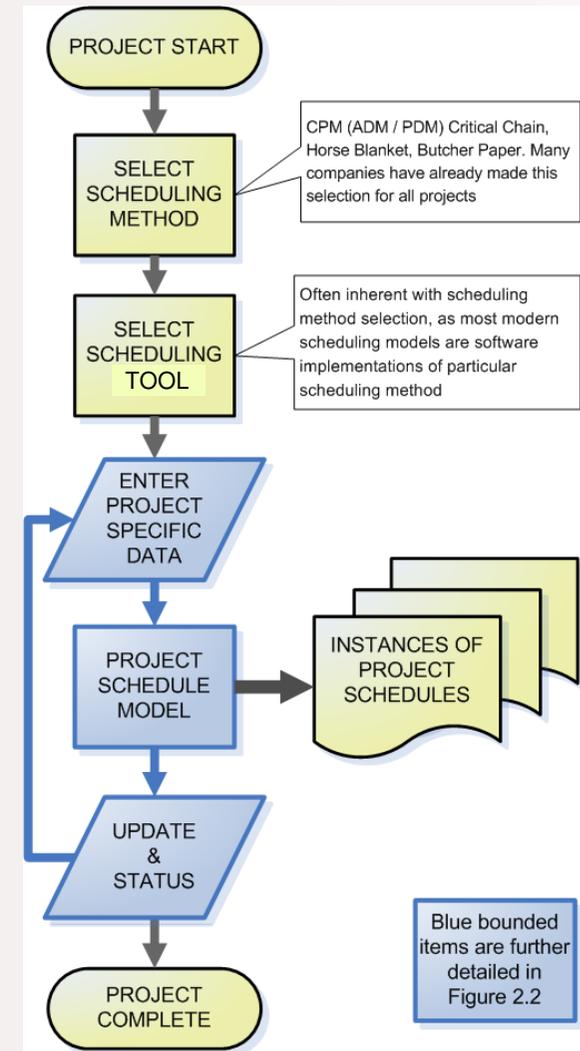


Figure 2.1 – Schedule Development Process  
*The Practice Standard for Scheduling*

# The Project Update Cycle

- Cycle too long =
  - Insufficient detail causing loss of control
  - Loss of focus on ‘working the schedule’
- Optimum cycle = 1 or 2 weeks
- Maximum cycle = Monthly
- Shorter cycles only if:
  - Very intense / short project with a high rate of change

# Designing the 'Road Map'

- Plan the schedule development: Key Steps (one step at a time!)
  - Identify Milestones
  - Identify **ALL** Activities  
(Rolling Wave / Schedule Density add detail not new work)
  - Sequence the Activities in the logic diagram
  - Estimate optimum durations for Activities
  - Time Analyse the schedule
  - Problem solve & edit to meet objectives

# Milestones

- Mandated
  - Start Milestone
  - Finish Milestone
- Useful Milestones
  - Deliverables to ‘others’ (eg the client)
  - External Dependencies (inputs from ‘others’)
  - Gateways / Hold Points
  - Phase Boundaries / reporting points

A Milestone is a Zero Duration activity that marks a significant point or event in a project

Personal preference – ALL constraints are placed on Milestones

# Activity Identification

- Involve Stakeholders and Team
- Use formal techniques, eg WBS
- Use Brain Storming techniques
- Test for completeness
- Keep level of detail consistent with your 'plan for the schedule'
- Identify all Activities before moving onto next stage

# Attributes of a 'Good Activity'

- A discrete element of work
- A single person is responsible for managing the performance of the work
- Its description is unique and unambiguous
- The work is capable of proceeding to completion without interruption
- Its duration is less than twice the update cycle (or undividable)

# Sequence the Work

- Organise the activities into a logical sequence
- Only use 'real logic'
- Use Finish-Start relationships where possible
- Keep getting agreement

'Real logic' can be:

- Dictated by the intrinsic nature of the work
- Mandated by the contract
- A sequence of work that is an express intention of the project team

The first two options above are *mandatory* logic; the third one is *discretionary* logic; but they are all 'real'. Artificial logic should be discouraged as it distorts the schedule and can have unintended consequences as the schedule changes during the life of the project.

# Building the Road Map

- The key questions for each Activity are:-
  - What has to be completed to allow this Activity to start?
  - What cannot start until this Activity is completed?
  - What can happen at the same time as this Activity?

# Building the Road Map

- Developing a logical statement is difficult
  - Managers and team leads need to contribute
  - Everyone needs to understand and agree
- Post-it notes provide a useful tool
  - Visibility as the logic is created
  - Focus on the artefacts not the people
  - Limits to size and complexity (KISS)



# Building the Road Map

- The resulting logic is the ‘road map’ showing the sequence of work from the beginning to the end of the project, phase, or section of the work
- The level of detail depends on:
  - The design of the schedule
  - The ‘Level’ of the schedule
  - The ‘Density’ used for the schedule

# Building the Road Map

- Every Activity and Milestone should be connected:
  - From its start to at least one predecessor and can trace its logical predecessors to the Start Milestone
  - From its finish to at least one successor and can trace its logical successors to the Finish Milestone

See: *Dynamic Scheduling* -  
[www.mosaicprojects.com.au/PDF/Dynamic\\_Scheduling.pdf](http://www.mosaicprojects.com.au/PDF/Dynamic_Scheduling.pdf)

# Getting a Good Schedule

- Questions to ask:
  - Is the scheduler qualified?
  - Was the management team involved?
  - Is the schedule technically correct?
  - Is the schedule sensible?
  - How are resources managed?
    - Only important in the short term (schedule density)

# Qualifications

- AACEi – PSP
  - Construction / Engineering / Claims
- PMI PMI-SP
  - PMO Manager / Controls Manager
- Guild of Project Controls
  - Multi faceted

See: *Scheduling Training and Certifications* -  
[www.mosaicprojects.com.au/Planning.html#Certifications](http://www.mosaicprojects.com.au/Planning.html#Certifications)

# Management Involvement?

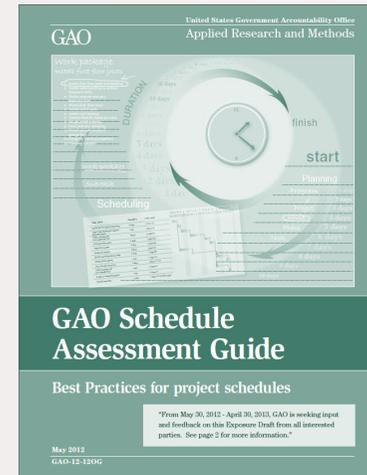
- Ask – if the project management team cannot be bothered to work on developing the schedule they will not be bothered to use the schedule
- Is it their schedule
- Do they really understand it???

# Technical Correctness

- There is a proven correlation between technically correct schedules and project outcomes (Dr. Dan Paterson)
- Use the available tools to run checks:
  - Acumen Fuse
  - Schedule Analyzer
  - Schedule Inspector

# Technical Correctness

- Use the free references:
  - DCMA 14 Point schedule assessment
  - GAO Schedule Assessment Guide



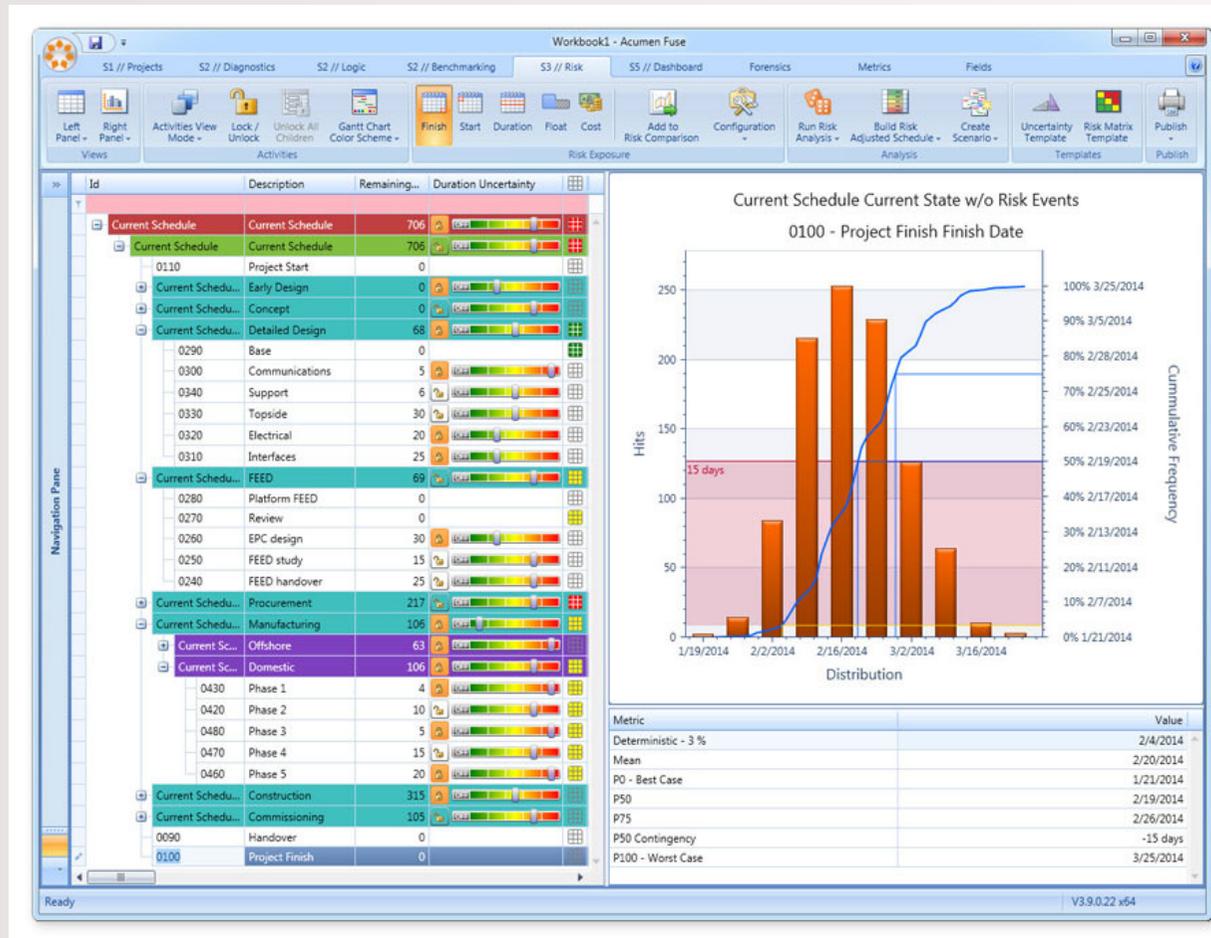
See: *Schedule Quality & Conformance Scoring* -  
[www.mosaicprojects.com.au/Planning.html#Conformance](http://www.mosaicprojects.com.au/Planning.html#Conformance)

# Schedule Validity

- Is the schedule reasonably sensible is subjective!
  - Is risk and uncertainty properly managed
  - Is the level of detail appropriate for the current level of knowledge
  - Independent assessment options: SCRAM

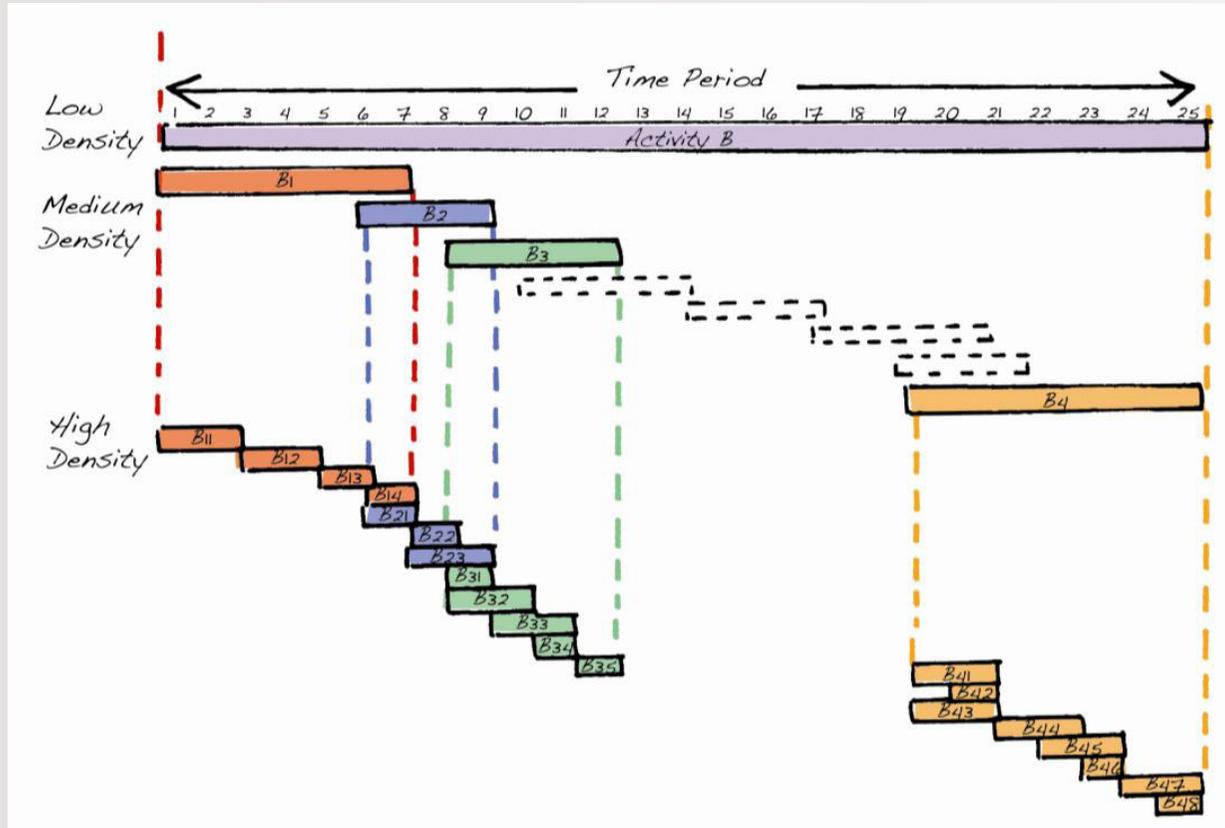
# Schedule Validity

- Risk Modelling – how was it done??



# Appropriate Detail

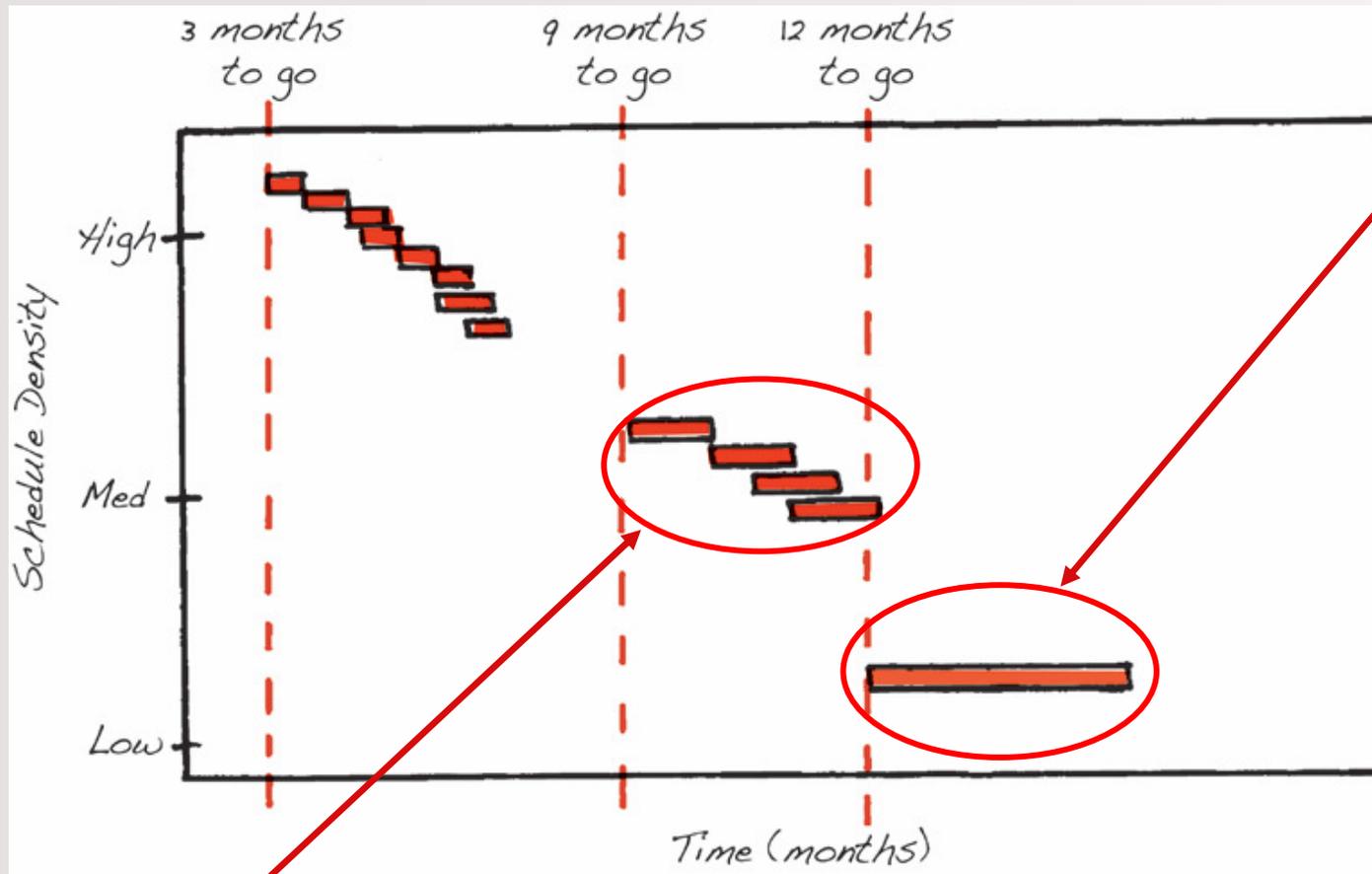
Figures © Guide to Good Practice in the Management of Time in Complex Projects



Activities are progressively expanded to greater levels of 'density' as more information becomes available

Unless the work is designed in its entirety and all subcontractors and specialists appointed before any work commences, it is impossible to plan the work in its entirety, in detail at the beginning of a project.

# Schedule Density

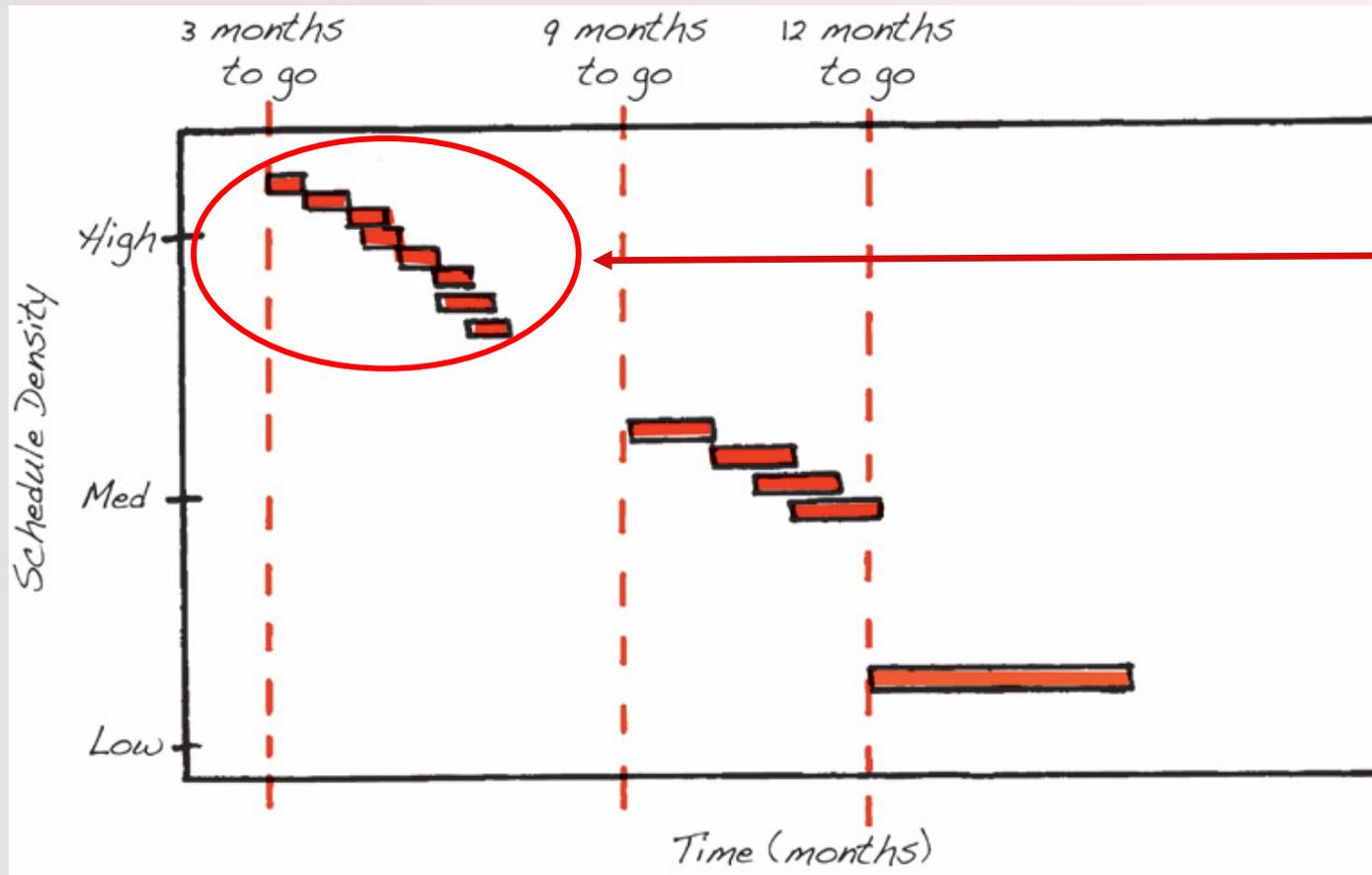


Low-density is appropriate for work, which is intended to take place 12 months, or more in the future.

Tasks may be several months in duration

Medium density is appropriate for work, which is intended to take place between 3 and 9 months after the schedule date. At this stage the work should be designed in sufficient detail to be allocated to contractors, or subcontractors. Task durations should not exceed 2 months.

# Schedule Density



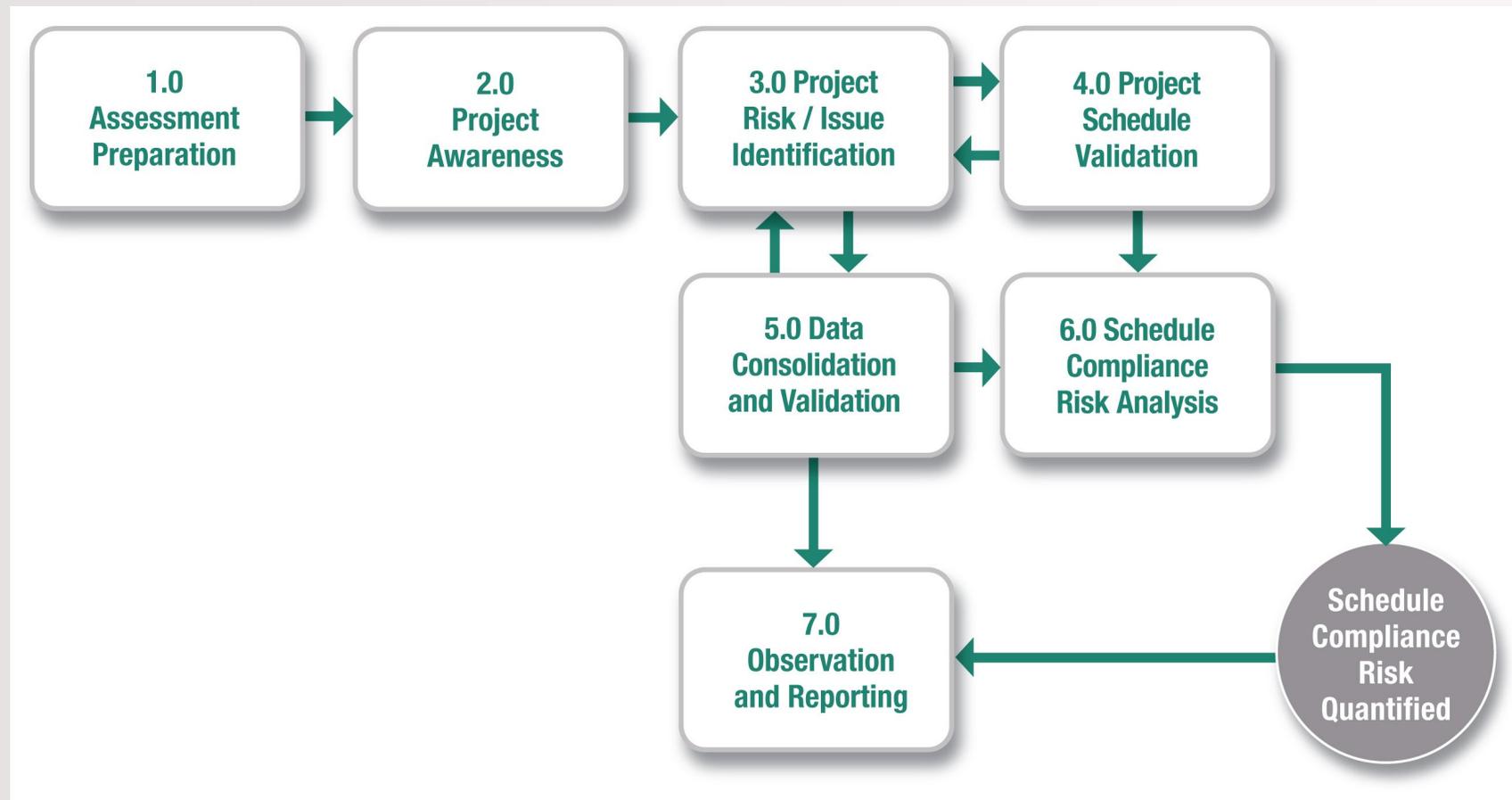
High-density scheduling is an essential prerequisite for undertaking work. The schedule is prepared with the people doing the work.

Task durations should be no more than the update cycle

As the density is increased, adjustments to the plan take into account actual performance to date, resources, work content, and other factors necessary to achieve the overall schedule objectives.

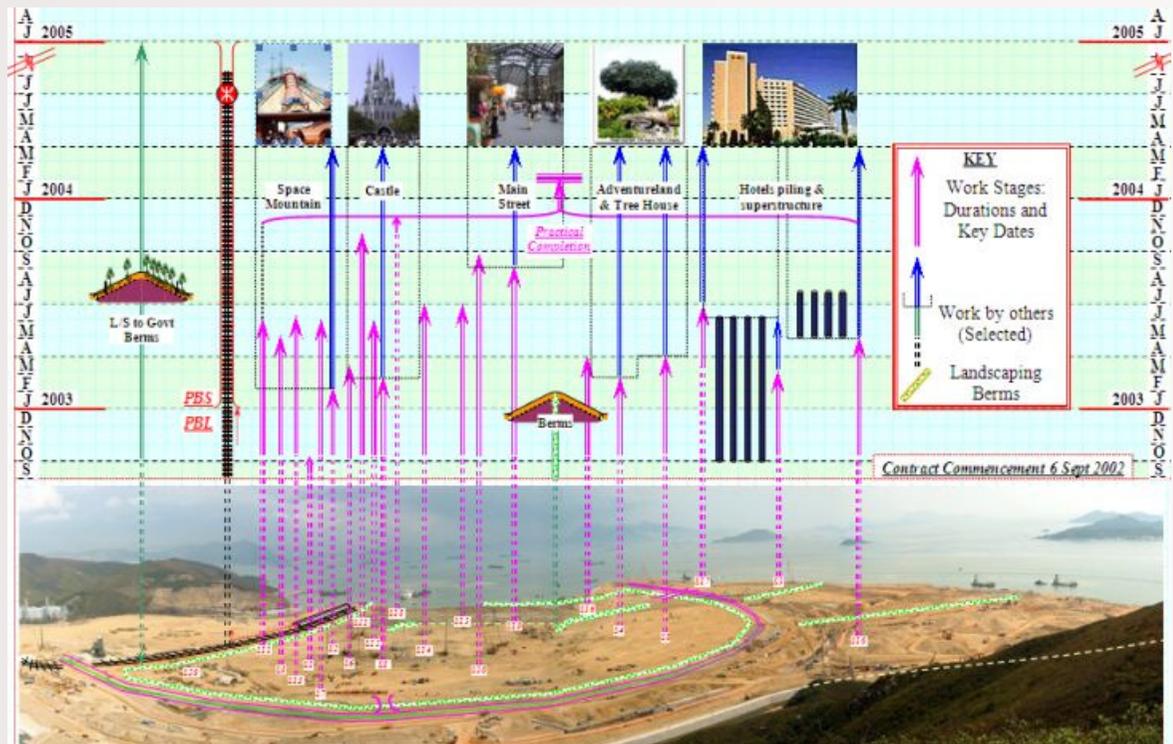
# Schedule Validity

- The SCRAM model [www.scramsite.org](http://www.scramsite.org)



# Communication is the key

- Executive Reports / Health reports
  - Dashboards



## Time/Location images

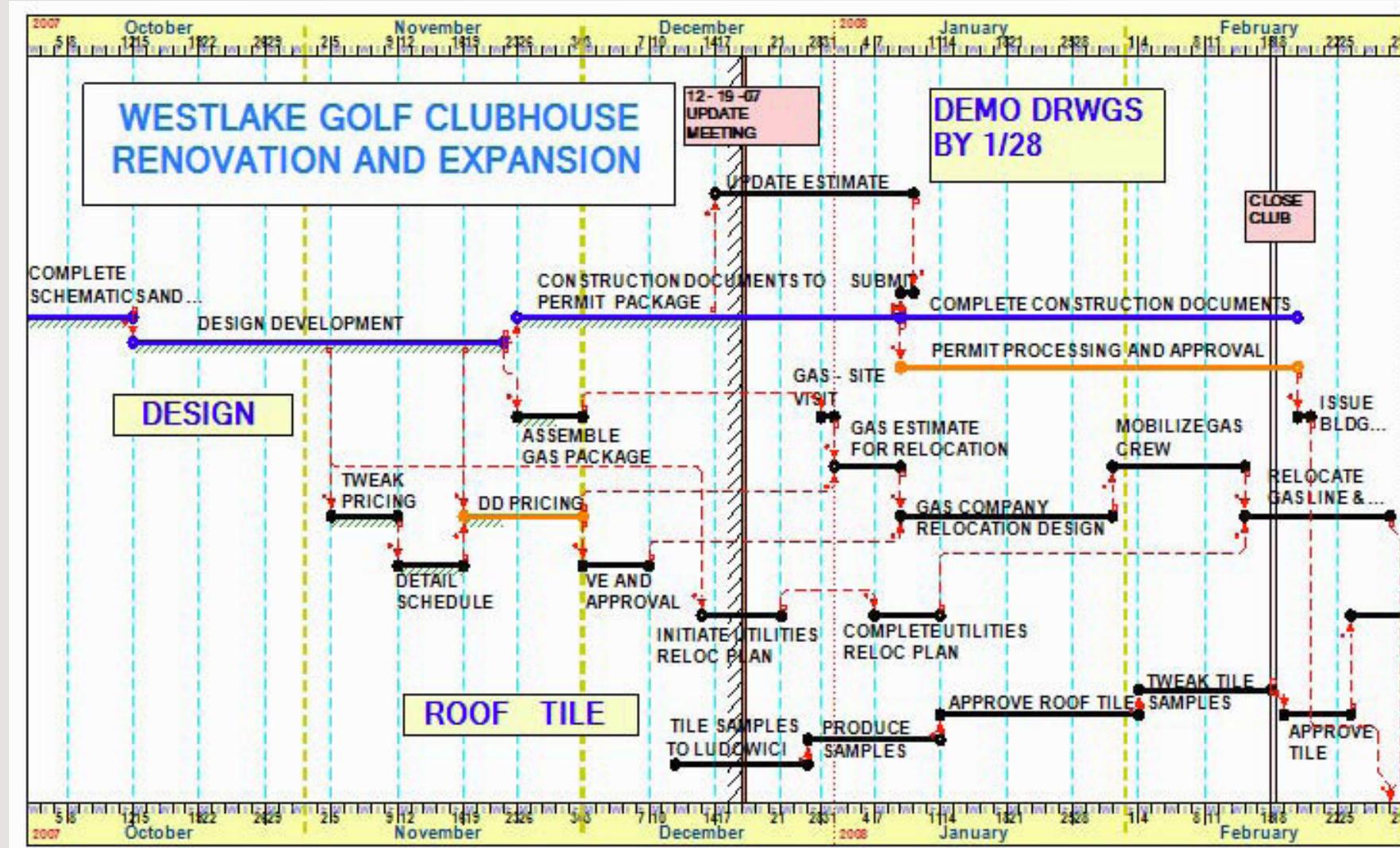
Hong Kong's Disneyland Resort: the panorama with individual photos and a vertical timescale provide an excellent visual perspective to the project

These high level reports, should be supported by a Level 3 Master Schedule against which actual progress will be measured

# Communication is the key

- Graphical tools

CASCAD-e



# Conclusion

- A good schedule will not guarantee project success. But.....
- A bad schedule will guarantee project failure on complex projects
- There's no longer any excuse for bad schedules

# Questions

- Free resources:

[www.mosaicprojects.com.au/Planning.html](http://www.mosaicprojects.com.au/Planning.html)

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