



**Australian Government**

# **ICTRFN6098B Monitor the capacity of and recommend changes to the cellular mobile network**

**Release 1**

## ICTRFN6098B Monitor the capacity of and recommend changes to the cellular mobile network

### Modification History

Release	Comments
Release 2	This version first released with <i>ICT10 Integrated Telecommunications Training Package Version 3.0</i> .  References to other units updated.  Outcomes deemed equivalent.
Release 1	This version first released with <i>ICT10 Integrated Telecommunications Training Package Version 1.0</i> .

### Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to make recommendations on cellular mobile network systems at the system design level.

### Application of the Unit

Technical officers and engineers may apply the skills and knowledge in the unit. They undertake mobile network performance measurements and report on mobile capacity enhancement to senior management.

### Licensing/Regulatory Information

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

### Pre-Requisites

Not applicable.

## Employability Skills Information

This unit contains employability skills.

### Elements and Performance Criteria Pre-Content

Element	Performance Criteria
<i>Elements describe the essential outcomes of a unit of competency.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.</i>

### Elements and Performance Criteria

1. Monitor the capacity of the cellular mobile network	1.1 Monitor <b>traffic levels</b> from the network management system 1.2 Use approved enterprise plans to identify planned network growth 1.3 Obtain <b>customer forecast</b> data from marketing 1.4 Apply identified data against <b>capacity trigger</b> criteria 1.5 Determine <b>coverage</b> and cell parameters
2. Make recommendations relating to capacity changes	2.1 Identify <b>requirements</b> for additional capacity 2.2 Recommend changes or additions to <b>frequency parameters</b> and submit to planning personnel 2.3 Assess capacity of <b>transmission path and switch resources</b> and recommend improvements noting <b>transmission medium</b> 2.4 Manipulate traffic through <b>switch parameter settings</b> as a means of relieving traffic congestion 2.5 Determine cost of proposed changes and undertake studies of appropriate return on investment (RoI)
3. Assess capacity changes	3.1 Organise tests and studies to ensure that increased capacity adequately caters for traffic flow 3.2 Make recommendations for further change to network should the increase capacity not meet need

## Required Skills and Knowledge

*This section describes the skills and knowledge required for this unit.*

### Required skills

- analytic skills to interpret capacity requirements
- communication skills to:
  - liaise with internal and external personnel on technical and operational matters
  - relate to work associates, supervisors, team members and clients
- literacy skills to:
  - interpret technical documentation, such as equipment manuals, specifications and service orders
  - write reports using standard formats
- numeracy skills to estimate costs and calculate return on investments
- planning and organisational skills to plan, prioritise and monitor own work and coordinate the capacity measurement process in liaison with others
- problem solving and ability to convey solutions to others
- task management skills to work systematically with required attention to detail
- technical skills to:
  - select and use appropriate tests to measure cell capacity usage
  - use teletraffic statistical data.
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### Required knowledge

- blocking, non-blocking and grade of service
- Erlang B measurements
- features and operating requirements of test equipment
- field measurements for cell traffic capacity
- information required to:
  - analyse and interpret statistical data as applied to teletraffic measurement
  - prepare and conduct a capacity measurement
- legislation, codes of practice and other formal agreements that directly impact on radio communications site transmission
- overview knowledge of:
  - transmission lines
  - transmitter and receiver architecture and their impact on radio communications traffic
- switching architecture and in particular space and time switching
- types of adjustments that need to be made to procedures to meet the requirements of particular sites and environmental conditions
- typical issues and challenges that occur in telecommunications cellular capacity design and how these may be addressed
- workplace and industry environment.

## Evidence Guide

*The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.*

<b>Overview of assessment</b>	
<b>Critical aspects for assessment and evidence required to demonstrate competency in this unit</b>	<p>Evidence of the ability to:</p> <ul style="list-style-type: none"> <li>• source and analyse relevant data to prepare a plan indicating growth potential and recommendations for meeting growth within timeframes</li> <li>• use tools and software packages for forecasting and measurement</li> <li>• identify site or channel capacity, relevant network growth and forecasting growth.</li> </ul>
<b>Context of and specific resources for assessment</b>	<p>Assessment must ensure:</p> <ul style="list-style-type: none"> <li>• access to sites with cellular mobile network</li> <li>• capacity monitoring data and equipment.</li> </ul>
<b>Method of assessment</b>	<p>A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:</p> <ul style="list-style-type: none"> <li>• direct observation of the candidate undertaking a practical monitoring exercise</li> <li>• evaluation of report prepared by the candidate outlining recommendations relating to capacity changes</li> <li>• oral or written questioning to assess required knowledge.</li> </ul>
<b>Guidance information for assessment</b>	<p>Holistic assessment with other units relevant to the industry sector, workplaces and job role is recommended, for example:</p> <ul style="list-style-type: none"> <li>• ICTRFN5148A Test and measure cellular phone and network equipment performance</li> <li>• ICTTEN6169A Produce and evaluate architecture designs for convergent cellular mobile networks</li> <li>• ICTPMG8149B Evaluate and use telecommunications management networks.</li> </ul>

	<p>Aboriginal people and other people from a non-English speaking background may have second language issues.</p> <p>Access must be provided to appropriate learning and assessment support when required.</p> <p>Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed.</p> <p>In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.</p> <p>Where applicable, physical resources should include equipment modified for people with special needs.</p>
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## Range Statement

*The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.*

<b>Traffic levels</b> may be found in:	<ul style="list-style-type: none"> <li>• Erlang or centum call seconds (CCS) form per site:             <ul style="list-style-type: none"> <li>• circuit switching or packet switching networks hardware units</li> <li>• network management tools.</li> </ul> </li> </ul>
<b>Customer forecast</b> may include:	<ul style="list-style-type: none"> <li>• simulate decrease in traffic requirement</li> <li>• simulate increase in traffic requirement.</li> </ul>
<b>Capacity trigger</b> may include:	<ul style="list-style-type: none"> <li>• 'no service' complaints</li> <li>• business plan targets or forecast method</li> <li>• decisions to target certain clients</li> <li>• decisions to target certain sites</li> <li>• geographical considerations</li> <li>• industry status</li> <li>• investigation for improvement of service.</li> </ul>
<b>Coverage</b> includes:	<ul style="list-style-type: none"> <li>• radio base station capacity parameters:             <ul style="list-style-type: none"> <li>• available channels per cell</li> <li>• available channels per sector.</li> </ul> </li> </ul>
<b>Requirements</b> may include:	<ul style="list-style-type: none"> <li>• frequencies</li> <li>• hardware requirement</li> <li>• radio channels</li> <li>• transmission availability.</li> </ul>
<b>Frequency parameters</b> may include:	<ul style="list-style-type: none"> <li>• degree of separation</li> <li>• frequencies</li> <li>• frequency reuse</li> <li>• interference levels</li> <li>• signal levels.</li> </ul>
<b>Transmission path and switch resources</b> may include:	<ul style="list-style-type: none"> <li>• transmission capacities:             <ul style="list-style-type: none"> <li>• between switching elements</li> <li>• on radio path</li> </ul> </li> <li>• group switch resources.</li> </ul>
<b>Transmission medium</b> may include:	<ul style="list-style-type: none"> <li>• coaxial cable</li> <li>• copper cable</li> <li>• microwave link</li> </ul>

	<ul style="list-style-type: none"><li>• optical fibre cable</li><li>• satellite.</li></ul>
<i>Switch parameter settings</i> may include:	<ul style="list-style-type: none"><li>• switching architecture for arrangements:<ul style="list-style-type: none"><li>• routing tables</li><li>• switching routing</li><li>• time-space-time (TST).</li></ul></li></ul>

## Unit Sector(s)

Telecommunications - Radio frequency networks