



Australian Government

CPPSIS6043A Develop, monitor and maintain geographic information systems

Release 1

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Modification History

Version	Comment
1	This version first released with CPP07 Property Services Training Package Version 12.

Unit Descriptor

This unit of competency specifies the outcomes required to develop, monitor and maintain geographic information systems (GIS) to produce specified data outcomes for geographic information.

Application of the Unit

This unit of competency supports the application of planning, organising, monitoring, problem-solving, error analysis and accuracy; designing and interpreting technical documentation; and a practical understanding of technology. The skills and knowledge acquired on completion of this unit would support the needs of employees in surveying and spatial information services (SSIS).

Licensing/Regulatory Information

No licensing, legislative and regulatory requirements apply to this unit at the time of endorsement.

Pre-Requisites

Nil

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

Performance criteria describe the required performance needed to demonstrate achievement of the element. Where ***bold italicised*** text is used, further information is detailed in the required skills and knowledge and/or the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

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|---|--|-----|--|
| 1 | Develop applications. | 1.1 | Client needs and constraints in relation to GIS are identified and clarified in consultation with <i>end users</i> to establish <i>end result specifications</i> . |
| | | 1.2 | Information required to achieve result is defined and required <i>data</i> sets are determined. |
| | | 1.3 | Service options are evaluated and application requirements are determined via <i>internal and external sources</i> . |
| | | 1.4 | Pilot applications are tested and production systems are implemented in consultation with relevant personnel and according to <i>industry standards</i> . |
| | | 1.5 | Applications are customised to meet the needs of the client. |
| 2 | Monitor effectiveness of applications. | 2.1 | Applications are monitored and evaluated against end user requirements. |
| | | 2.2 | Applications are modified as appropriate to meet client and end user requirements. |
| 3 | Customise processes to improve the efficiency of GIS environments. | 3.1 | Appropriate macros and <i>scripts</i> are designed for <i>customising software applications</i> to meet client needs. |
| | | 3.2 | Customisations are automated where appropriate. |
| | | 3.3 | Graphical user interfaces (GUI) are created and customised to meet requirements of end users. |

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|---|-------------------------------------|-----|--|
| 4 | Manage and store spatial data sets. | 4.1 | New source data is updated and inserted into a digital base using appropriate hardware and software. |
| | | 4.2 | Appropriate links are created between spatial and textual databases. |
| | | 4.3 | Spatial and attribute data is interrogated to achieve <i>required outcome.</i> |
| | | 4.4 | Applications for spatial data sets are maintained. |

Required Skills and Knowledge

This section describes the essential skills and knowledge and their level, required for this unit.

Required skills

- analytical skills to analyse GIS system options and application architecture
- communication skills to:
 - consult effectively with clients and colleagues
 - impart knowledge and ideas through oral, written and visual means
- initiative and enterprise skills to:
 - negotiate with clients
 - interpret project requirements
 - translate requirements into design
- literacy skills to:
 - assess, develop and use workplace information
 - prepare and manage documentation and information flow
 - read and write specification reports, including technical reports
 - research and access information in order to source geographic information
- numeracy skills to:
 - analyse errors
 - estimate costs
 - perform mental calculations
 - record with accuracy and precision
- planning and organising skills to:
 - plan and prioritise activities to meet contractual requirements
 - conduct project activity
 - manage information
- self-management skills to:
 - maintain attention to detail
 - manage project activity
 - meet deadlines
- spatial skills to:
 - archive and retrieve spatial data
 - capture geographic information
 - manage and manipulate spatial data
- technology skills to use computers to develop business documentation

Required knowledge

- data management processes
- data reduction and manipulation techniques
- database structures, including the relationship of spatial features of database
- generic query language, such as structured query language (SQL)
- GIS software, such as:
 - ArcInfo
 - GenaMap
 - MapInfo
- GIS application development methods
- hardware, including:
 - digitisers
 - local and wide area networks
 - multimedia technology
 - plotters
 - printers
 - scanners
 - servers
 - workstations
- key features of line instructions and programming
- legislation relating to:
 - appropriate Acts
 - copyright
 - freedom of information
 - intellectual property
 - trade practices
- organisational and industry policies and practices relating to developing, monitoring and maintaining GIS:
 - custodianship of data
 - industry practices, policies and standards
 - pricing and access
 - statutory requirements
- potential inaccuracies and problems with GIS data
- principles of database theory
- relationship between user needs and the application development cycle
- requirements relevant to developing, monitoring and maintaining geographic information systems:
 - accuracy and precision requirements
 - data formats
- scripting techniques

- system analysis and design in relation to GIS
- use of macros

Evidence Guide

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

Overview of assessment	This unit of competency could be assessed on its own or in combination with other units relevant to the job function, for example CPPSIS6042A Coordinate information gathering and GIS development and CPPSIS6044A Manage GIS data.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	A person who demonstrates competency in this unit must be able to provide evidence of: • developing GIS applications in line with organisational and client needs • monitoring and maintaining GIS applications • knowledge of GIS systems.
Specific resources for assessment	Resource implications for assessment include access to: • assessment instruments, including personal planner and assessment record book • assignment instructions, work plans and schedules, policy documents and duty statements • registered training provider of assessment services • relevant guidelines, regulations and codes of practice • suitable venue and equipment. Access must be provided to appropriate learning and assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.
Context of assessment	Holistic: based on the performance criteria, evidence guide, range statement, and required skills and knowledge.
Method of assessment	Demonstrated over a period of time and observed by the assessor (or assessment team working together to conduct the assessment). Demonstrated competency in a range of situations, which may include customer/workplace interruptions and involvement in related activities normally experienced in the workplace. Obtained by observing activities in the field and reviewing induction information. If this is not practicable, observation in realistic simulated environments may be substituted.
Guidance information for assessment	Assessment requires that the clients' objectives and industry expectations are met. If the clients' objectives are narrowly defined or not representative of industry needs, it may be necessary to refer to portfolio case studies of a variety of SIS requirements to assess

competency.

Oral questioning or written assessment and hypothetical situations (scenarios) may be used to assess underpinning knowledge (in assessment situations where the candidate is offered a preference between oral questioning or written assessment, questions are to be identical).

Supplementary evidence may be obtained from relevant authenticated correspondence from existing supervisors, team leaders or specialist training staff.

All practical demonstration must adhere to the safety and environmental regulations relevant to each State or Territory.

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 in the performance criteria is detailed below. Add any 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.

End users may include:

- elected members
- general public
- land information authorities
- local government
- real estate agents
- residents
- state and federal government departments
- statutory bodies, including land titles office
- transport companies
- utilities.

End result specifications may include:

- equations
- graphs
- maps
- parameters
- time available to complete the task
- tables.

Data may include:

- computer records
- graphical
- user application programs, such as:
 - accounting packages
 - databases
 - spreadsheets

- hard copy documents, such as:
 - books
 - maps
 - plans
 - work registers
- information, such as:
 - census data
 - community facilities
 - demographic data
 - local government facilities
 - organisational locations
 - property classifications
 - property boundaries
 - property ownership
 - transport routes
 - utilities
 - zonings
- spatial
- textual.

- Internal and external sources** may include:
- internal:
 - aerial photographs
 - deed books
 - plans
 - surveys
 - transaction books
 - external:
 - government departments or authorities
 - land titles office
 - local government
 - orthophotography
 - private industry
 - property agencies
 - street directory companies
 - surveys
 - telecommunications industry
 - water authorities
 - utility organisations
 - preparation of cross-sections and plans, with all information included
 - survey data demographic requirements.
- Industry standards** may include:
- confidentiality
 - informal practices not detailed in manuals or standard operating procedures
 - privacy
 - protocols.
- Scripts** may include:
- Java
 - Perl
 - Perl hypertext pre-processor (PHP)
 - visual basic (VB).
- Customising software applications** may include:
- creating applications for the following purposes:
 - cartography
 - counting visitors to website
 - keeping statistics
 - querying databases
 - processing information or forms.
- Required outcome** may include:
- building up elements of database
 - creating map layers
 - developing information for external or internal clients.

Unit Sector(s)

Surveying and spatial information services

Custom Content Section

Not applicable.