



**Australian Government**

# **CPPSIS4035 Apply GIS software to solve spatial data problems**

**Release: 1**

# CPPSIS4035 Apply GIS software to solve spatial data problems

## Modification History

Release 1.

Replaces superseded equivalent CPPSIS4035A Apply GIS software to problem-solving techniques.

This version first released with CPP Property Services Training Package Version 3.

## Application

This unit of competency specifies the outcomes required to use geographic information system (GIS) software applications to integrate data and solve spatial data problems. The unit covers setting up hardware and GIS software applications and using features, such as spatial overlay techniques, to solve problems and test and validate the cartographic integrity of data. The unit also covers producing reports based on analysing basic spatial data and archiving the data. The unit requires the ability to use entity and attribute queries to generate results for presenting spatial data, and using univariate statistics to explore datasets.

The unit supports those who work in support positions in a spatial information services team in areas such as field work coordination, data collection and administration.

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

## Pre-requisite Unit

Nil

## Unit Sector

Surveying and spatial information services

## Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the range of conditions.

- |                        |                                                                                                       |
|------------------------|-------------------------------------------------------------------------------------------------------|
| 1. Query spatial data. | 1.1. Task requirements are clarified with <b><i>appropriate persons</i></b> .                         |
|                        | 1.2. GIS software and equipment are set up and checked to ensure correct operation and functionality. |
|                        | 1.3. Spatial datasets are accessed, interpreted and                                                   |

- manipulated to ensure they are in acceptable format to meet task requirements.
- 1.4. Entities and attributes are used to display spatial information, and entity and attribute queries are used to generate summary results.
  - 1.5. Query results are used to present spatial data graphically according to organisational requirements.
  - 1.6. Entity and attribute queries are applied when using univariate statistics to explore the dataset.
  - 1.7. Routine spatial data problems or irregularities are identified and resolved in consultation with appropriate persons.
2. Solve spatial data problems.
    - 2.1. Existing spatial and aspatial data is adjusted to integrate with new data according to organisational requirements.
    - 2.2. Spatial techniques and tools are used to combine spatial layers data to solve problems, highlight selected features, and improve visual aspects.
    - 2.3. Spatial overlay techniques are used to solve problems and generate results relating to spatial task in consultation with appropriate persons.
    - 2.4. Cartographic integrity is tested and validated to solve accuracy and quality problems.
3. Produce reports based on basic spatial data analysis.
    - 3.1. Map or plans are integrated into reports according to task requirements.
    - 3.2. Results, summary statistics and graphs from mapping application are incorporated into reports according to organisational requirements.
4. Archive data.
    - 4.1. Spatial dataset to be archived is checked for completeness and manipulated where necessary, according to organisational requirements.
    - 4.2. **Metadata** is created according to organisational requirements.

- 4.3. Archived spatial data is stored in a secure location, and details are recorded according to organisational requirements.

## Foundation Skills

This section describes the language, literacy, numeracy and employment skills essential to performance in this unit but not explicit in the performance criteria.

| Skill                         | Performance feature                                                                                                                                                                                                                                                                    |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning skills to:           | <ul style="list-style-type: none"><li>• conduct research to access spatial updates.</li></ul>                                                                                                                                                                                          |
| Numeracy skills to:           | <ul style="list-style-type: none"><li>• apply understanding of height, depth, breadth, dimension and position to actual operational activity and virtual representation</li><li>• check accuracy of cartographic tolerances and measurements</li><li>• interpret statistics.</li></ul> |
| Oral communication skills to: | <ul style="list-style-type: none"><li>• ask questions to clarify task requirements.</li></ul>                                                                                                                                                                                          |
| Reading skills to:            | <ul style="list-style-type: none"><li>• interpret graphical information in vectors and rasters</li><li>• interpret technical information from maps and imagery.</li></ul>                                                                                                              |
| Writing skills to:            | <ul style="list-style-type: none"><li>• use organisational templates to integrate existing and new data.</li></ul>                                                                                                                                                                     |
| Technology skills to:         | <ul style="list-style-type: none"><li>• enter data into database or document using a computer and software</li><li>• operate a range of GIS software systems.</li></ul>                                                                                                                |
| Problem-solving skills to:    | <ul style="list-style-type: none"><li>• identify errors by cross-referencing validation results.</li></ul>                                                                                                                                                                             |

## Range of Conditions

This section specifies work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included. Bold italicised wording, if used in the performance criteria, is detailed below.

***Appropriate persons*** must include at least two of the following:

- colleague
- end user
- supervisor or line manager
- supplier.

***Metadata*** must include at least four of the following:

- availability
- conditions of use
- coordinate system
- currency
- custodian
- data accuracy
- data description
- date of acquisition
- licence
- quality
- source
- spatial data acquisition methodologies
- version control.

## Unit Mapping Information

CPPSIS4035A Apply GIS software to problem-solving techniques

## Links

Companion Volume implementation guides are found in VETNet -  
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=6f3f9672-30e8-4835-b348-205dfcf13d9b>

# Assessment Requirements for CPPSIS4035 Apply GIS software to solve spatial data problems

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## Performance Evidence

A person demonstrating competency in this unit must satisfy the requirements of the elements, performance criteria, foundation skills and range of conditions of this unit. The person must also use geographic information system (GIS) software applications to integrate data and solve spatial data problems for two different tasks.

While undertaking the above tasks, the person must:

- combine spatial layers data, including:
  - raster, including aerial and terrestrial photography and satellite imagery in digital format
  - vector overlay
- comply with organisational requirements for documentation and reporting relating to:
  - audit trails
  - naming standards
  - templates
  - version control
- comply with organisational requirements to work safely when using the equipment specified in the assessment conditions
- comply with legal and ethical requirements for producing reports based on spatial data analysis
- display spatial information using entities and attributes, including:
  - arcs
  - circles
  - colour
  - hatch
  - layer
  - level
  - lines, including type and width
  - symbology
  - text
- manage and manipulate a range of spatial data, including:

- digital
- hard copy
- image
- text
- raster
- vector
- operate a range of GIS software to perform entity and attribute queries and explore datasets
- use geospatial techniques, including:
  - buffer
  - clip
  - dissolve
  - intersect
  - merge union
  - overlay.

## Knowledge Evidence

A person demonstrating competency in this unit must demonstrate knowledge of:

- legal requirements for accessing, manipulating, reporting and archiving digital and hard copy spatial data, including data privacy and information copyright
- methods for using univariate statistics and charting, including:
  - arithmetic mean, median and mode
  - histograms that illustrate the concepts of normal and other distributions
  - maximum and minimum
  - range
  - standard deviation
  - variance
- methods for validating test results to identify systematic distortions in accuracy of information
- printing and image formats for map production
- querying and browsing techniques for obtaining information from databases and solving problems
- spatial data storage technology
- spatial overlay techniques
- key features of spatial reference systems.

## Assessment Conditions

The following must be present and available to learners during assessment activities:

- equipment:

- computer with access to GIS software applications
- printer and other hardware necessary for work tasks
- specifications:
  - organisational policies and procedures relating to:
    - work health and safety
    - data privacy and information copyright
- physical conditions:
  - access to equipped work station
- relationships with team members and supervisor:
  - working in a team.

Timeframe:

- as specified by task and organisational requirements.

### Assessor requirements

As a minimum, assessors must satisfy the assessor requirements in the Standards for Registered Training Organisations (RTOs) current at the time of assessment.

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