

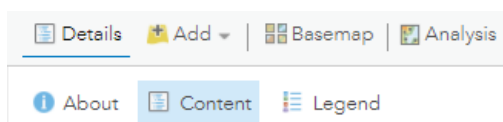
Interconnections: transportation networks

Lesson Map: <http://esriaustralia.com.au/education/SpatialActivity97>

Engage

Where is Australia's population distributed?

- Click on the map URL above to open the lesson map. A grey canvas map showing Australia appears. Under the 'Details' pane, click on 'Content'. You will notice that the *Population Density* layer is the only layer turned on.

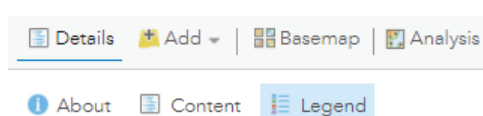


- This layer does not show up in the legend. However, it is known that deeper shades of purple represent higher density areas, whereas the lighter the shade of purple, the less densely populated.
- ? What observation/s can you make about the distribution of Australia's population?
[Australia's population is mostly distributed near the country's coastlines. Significant population-dense areas exist in each state's major cities.]
- ? What reasons can you identify that may contribute to this pattern of population distribution?
[Reasons will vary but may include: arable land for agriculture and livestock, access to water supply, inner Australia = semi-arid/arid biome, access to coasts for trade, access to coasts for recreation.]

Explore

How do supply-chain logistics influence transport networks?

- In addition to the *Population density* layer, turn on the *Major airports* and *Major seaports* layers. You can check the symbology of these layers by clicking on 'Legend'.



Download student worksheet [here](#).

Time
30 minutes

Activity

Investigate how Australia's transportation networks connect people to services.

Learning Outcome

Students will be able to:

- Examine how transport networks operate to connect people to services, including how supply-chain logistics influence these connections
- Interpret and analyse geographical information using digital and spatial technologies

ACARA Curriculum Link

[Year 9 Geography: Geographies of interconnections](#)

[ACHGK066](#) | [ACHGK067](#) |
[ACHGS067](#) | [ACHGS070](#)

Teacher Feedback:

To share your feedback on this, or any Spatial Activity, please contact education@esriaustralia.com.au

- ? What pattern do you notice between population density and the location of major airports and seaports? *[Most major airports or seaports are in or near major cities or are in areas along the coastline in denser population areas.]*
- ? Are there any exceptions or anomalies to this general pattern? If so, identify these. *[One clear exception to this pattern can be observed in the cluster of major seaports present in the north-west region of Western Australia.]*
- In the 'Contents' pane, turn on *Australia's operating mines (2015)*. You can check the symbology of this layer by clicking on 'Legend'.
- ? Observe the cluster of seaports in the north-west region of Western Australia. Considering the presence of operating mines in Western Australia, what purpose do these seaports most likely have? *[These major seaports were likely built to provide a secure place for freight ships to dock while mining resources are loaded onto the. The resources would then be exported overseas or transported to other areas of Australia.]*
- In the 'Contents' pane, turn on *Railway infrastructure*. You can check the symbology of this layer by clicking on 'Legend'.
- ? Observe the same north-west region of Western Australia as you toggle the *Operating mines* layer on and off. What conclusions can you make about the construction of the railway infrastructure in this region? *[The construction of railway infrastructure in the north-west region of Western Australia is the result of economic factors. Railway lines provide mining companies with the capability to construct, develop and maintain mining operations, and allow for the easy transportation of mined resources over land to seaports.]*

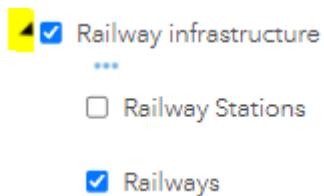
Explain

How does access to transportation networks differ between rural and urban areas?

- In the 'Details' pane, under the heading 'Content', turn off the following layers: *Major airports, Major seaports, Australia's operating mines* and *Railway infrastructure*. Turn on the *All airports and heliports* layer. You can check the symbology of this layer by clicking on 'Legend'.
- ? Toggle the *Australia's operating mines* layer on and off as necessary. What may explain the presence of airports near mining operations? *[Many mining employees are 'Fly In, Fly Out' (FIFO) workers, where the mining company flies employees in for their rostered workdays and flies them back to their home city for their rostered days]*

off. These airports and airstrips were likely constructed for this purpose.]

- ? Leave the *Australia's operating mines* layer on. What may explain the presence of airports in rural areas where no mining operations are in the vicinity (e.g. Central and South-West Queensland)? *[The presence of airports in rural areas like Central and South-West Queensland may be to service rural and remote towns and communities. These airports may be used to deliver postal services, provide health services or function as a landing area for medical emergencies and rescues. Alternatively, some of these airports are likely private airports on military bases.]*
- Under the 'Contents' pane, turn off *Australia's operating mines* and *All airports and heliports*. Expand the *Railway infrastructure* layer by clicking on the arrow to the left of the layer. Turn on this layer.



- You can toggle the *Railway Stations* layer on and off and view the symbology of the stations in the 'Legend' pane as desired. There are a lot of train stations and turning this layer on and off is useful when wanting to see the railway lines.
- ? In your own words, describe the spatial distribution of railway lines and train stations. In your response, compare the difference in characteristics between high-density and low-density areas. **Hint: zoom in on a particular high-density location and low-density location to compare the differences.** *[There are significantly more railway networks and train stations in population or urban centres, like Brisbane, Melbourne and Sydney. In high-density areas, train stations are more frequent along the railway line. However, low-density areas like rural or regional towns usually only have one railway line servicing the area rather than a network of railway lines. Furthermore, train stations along these lines are less frequent, with the train covering more distance between stops.]*
- Although railway lines do provide rural and regional areas with a transport option to larger urban centres, it is likely that members of the local community must still rely on private transport to access public transport or other local services.

Extend

How does transportation infrastructure promote or inhibit access to services in your local area?

- In the 'Details' pane, under the heading 'Content', turn off all layers except for the *Population density* layer.
- Using the address search bar, type in the name of the city or town that you live in or nearby. If you do not live close to a city or town, zoom into the region that you live in.

Roma, Queensland, AUS

- You may need to zoom out a little bit to see more of the city, town or region.
- In the 'Contents' pane, toggle the following layers on and off and make notes about the transportation options in your chosen location:
 - Major airports
 - All airports and heliports
 - Railway infrastructure (train stations and railway lines)
 - Major road network (**note:** as you change map scales, the road networks that display on the map will also change. You can track this in the Legend)

Transportation options in my chosen location (example below: <i>Dalby, QLD</i>)	
Airports	<ul style="list-style-type: none"> - <i>No airports exist in Dalby</i> - <i>Closest minor airport is in Oakey, QLD but is for military use only (55km away)</i> - <i>Closest major airport is Brisbane West Wellcamp Airport, approx. 68km away on outskirts of Toowoomba</i>
Railways and train stations	<ul style="list-style-type: none"> - <i>Dalby is serviced by the Western Line railway, which comes from Toowoomba</i> - <i>In the heart of Dalby, this railway line splits into three lines to service rural towns that lie to the West</i> - <i>Total of three operational train stations in higher-density areas of the town</i> - <i>Total of two abandoned or dismantled train stations</i>
Road networks	<ul style="list-style-type: none"> - <i>The Warrego Highway passes through Dalby (East – West)</i> - <i>The Moonie Highway enters Dalby from the SW</i> - <i>The Bunya Highway enters Dalby from the NE</i>
Other (e.g. heliports)	<ul style="list-style-type: none"> - <i>One heliport exists in Dalby, which is on top of the hospital</i>

- ? In a paragraph response, summarise how transport infrastructure promotes or inhibits access to services in your chosen location. *[Student responses will vary depending on location chosen. Example response below.]*

Example response: Dalby is a small town approximately 200km west of Brisbane and 85km north-west of Toowoomba. Dalby's proximity to Toowoomba – a major regional centre – means that transportation infrastructure in the town is quite accessible. Three major highways – Warrego, Moonie and Bunya – intersect at Dalby, meaning that the town acts as a regional hub for the provision of services to the surrounding communities. In addition to this, three railway branches intersect in Dalby and provide access to the Western Line, a direct railway line to Toowoomba. There are three operational train stations in the town, however no train station provides close access to the southern part of town or the health district, where the hospital is present. This likely means that residents still require private transport or buses to get to and from their homes or to and from the hospital.

Next Steps:

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