

Character and Form



human scale

Overview



Indicator name	Street enclosure		
Indicator number	31	Indicator type	Supplementary
Objective	To measure the relationship between building height and street width, and explore the visual definition of a street		
Application guidance	<p>A sense of enclosure / openness contributes to the character and comfort of a street or area. A street aspect ratio that falls within the desirable range provides an environment that is at the appropriate human scale and influences a user's sense of comfort and safety in urban areas. It is also associated with climatic performance indicators such as shading, whereby higher enclosures tend to indicate less solar exposure and sky visibility on the ground plane, and wind, the effects of which can be accentuated in spaces with a high SAR.</p> <p>This indicator will support practitioners to understand the character and built form in urban and metropolitan areas. Based on the outcome of the assessment, practitioners can determine whether the visual field is appropriately enclosed based on the surrounding land-uses.</p> <p>Practitioners can use the <i>Street Aspect Ratio (SAR)</i> metric to measure the ratio of the average height of buildings to the width of road segments.</p>		

Metric



Street Aspect Ratio (SAR)

Related indicators



Access and Connection

- 2 Walking paths
- 7 Equitable access
- 8 Steepness



Comfort and Safety

- 24 Pedestrian crowding



Character and Form

- 32 Street space for pedestrians
- 35 Legibility

Recommendation



- To enrich the analysis, Sky View Factor could be incorporated. Sky View Factor is best represented as a fish-eye photograph of the sky from the street, with values ranging from zero to one. When obstacles block the sky, the factor goes to zero. When the sky is completely visible, the factor is one.
- Building density along the road could be considered in the analysis



Metric – Street Aspect Ratio (SAR)

Metric unit	Ratio
Description	To measure the ratio of the average height of buildings to the width of road segments
Spatial coverage	Applicable to all NSW
Spatial application	This metric is most suitable for link-based analysis and is most appropriately applied in urban metropolitan areas
Calculation methodology	<p>Calculate average road corridor width</p> <ol style="list-style-type: none">1. Use TfNSW Road Track Path Network to select roads accessible to pedestrians and bicycle riders2. Create vertices every 10m along the road network3. Create 25m distance perpendicular lines at vertices created from step14. Intersect with road corridor to calculate average intersected perpendicular line length. <p>Calculate average building height along road segment</p> <ol style="list-style-type: none">5. Find building footprints (Geoscape) from within 25m from each segment6. Calculate average height of the buildings. Attribute of average eave height from building footprint is used for building height. <p>Calculate Street Aspect Ratio</p> <ol style="list-style-type: none">7. For each longitudinal side of the street segment, calculate the SAR by dividing the average height by the road corridor width <div>$SAR = \frac{Average\ height}{Road\ average\ width}$</div> <p>Data representation</p> <ol style="list-style-type: none">8. Assign colour based on the classification below <ul style="list-style-type: none">• < 0.5:1 = streets that are likely to lack definition• < 2:1 = streets that are susceptible to feeling visually constrained causing the ‘canyon effect’ <p>Unit: Ratio</p> <div><div></div><div></div><div></div><div></div><div></div><div>< 0.5:1</div><div>0.5:1 – 1:1</div><div>1.1:1 – 1.5:1</div><div>1.5:1 – 2:1</div><div>> 2:1</div></div>
Assumption	<ul style="list-style-type: none">• Cadastre boundaries are used to help calculate the width between lots from side to side• After assessing various perpendicular line distances in a sample area, 25m as distance has been chosen, as it minimises both overshooting and undershooting
Limitation	<ul style="list-style-type: none">• Data availability in the road corridor dataset (ie. gaps in the data exist)• Outliers will need to be considered on an individual basis when averaging the SAR on both sides of the road, for instance in scenarios where one side of the road is developed, but the other side is parkland• Some road corridor polygons with irregular shapes do not represent the road width accurately. Practitioners can collect their own data to improve the accuracy.



Metric – Street Aspect Ratio (SAR) (Cont.)

Data source

- Spatial Services Road Corridor Boundaries: maps.six.nsw.gov.au/clipnship.html
- Spatial Services Cadastral Boundaries: maps.six.nsw.gov.au/clipnship.html
- TfNSW Road Track Path Network
- Geoscape® Buildings: geoscape.com.au/

Reference



N/A