

Indicating *Quality of Place* for station precinct development: enhancing 'place' in the place/node model

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Abstract: Transit Oriented Development (TOD), essentially the aggregation of urban activity and development around nodes in a public transport network, has been a strategic objective of many cities for at least two decades. Over a similar timeframe Bertolini's (1999) *node-place* model has been used to investigate the performance of these locations in this respect. The model identifies an optimal 'balanced' state where transport and land use functionality of station precincts are relatively even and TOD objectives could be said to be met. Unbalanced states indicate a latent potential toward achieving this desired objective. In practice the actualisation of this potential relies on a complex range of factors. Is it possible however to identify these factors in relation to the desired objective? Such knowledge could assist in guiding both public and private investment toward achieving TOD, making more efficient use of available resources. This research focuses on one aspect of this problem, identifying the underlying spatial qualities of place of precincts which would seem to be important in influencing their development towards TODs. An analytical framework is developed to achieve this and then applied to 13 passenger rail station precincts in the Perth Metropolitan area which allows a preliminary assessment of its validity for future application. This research has been undertaken as part of a broader research project initiated by the Planning and Transport Research Centre (PATREC) investigating the transport and land use characteristics of station precincts located within freeway medians in Perth.

Background

Transit Oriented Development (TOD) remains a strategic objective of metropolitan planning policy of many Australian and international cities. TOD promotes the aggregation of urban activity and development in close proximity to a public transport station or stop in a manner which supports walking and active transport access (Cervero, 1998). This typically equates to a focus area of 400 to 800m radius from the station or stop (Calthorpe, 1993).

The *node-place* model, proposed by Bertolini (1999) is used to gauge the degree to which TOD objectives have been achieved at these locations. This model presents the condition of a node in a public transport network, such as a passenger rail station precinct, relative to its transport and land use functionality. The condition is determined by the ratio between the values of two variables which relate to performance standards against these urban functions referred to in the model as the *node* and *place value* respectively.

The *node value* is derived from an aggregation of such measures as public transport capacity, network connectivity and service frequency as well as the active transport facility. The *place value* is typically constructed from an aggregation of measurements of the diversity and density of different human activities, confined to an area of influence. The chosen area of influence for measuring land use intensity is important as it can preference a more compact development objective (TOD) as opposed to a wider regional catchment approach.

Usually a diverse sample set of precincts is obtained and measured in order to report on a range of different conditions and allow a comparison and validation of empirical data. This also informs the clustering of performance territories (figure 1).

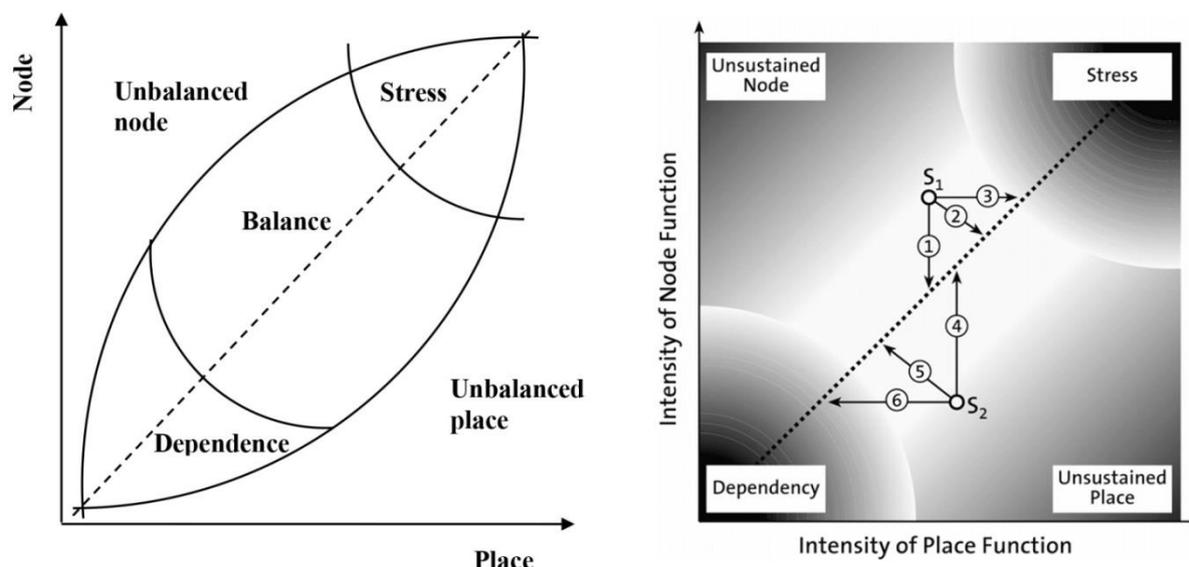


Figure 1: The node-place model (after Bertolini, 1999) and illustration of potential development pathways for discrete locations (Reusser et al, 2008).

The performance clusters support the integration or amalgamation of land use intensity with public transport facility. A *balanced* state is proposed as an optimal condition where node and place functionality are mutually supportive and public transport facility and land use intensity are relatively harmonious. When a compact territory is used to measure land use intensity this equates to a TOD objective. The *unbalanced* states represent areas where there is an excess value of one variable in relation to another.

The plot describes the value of the ratio at a given moment in time and is therefore a performance snapshot – a static representation of some underlying dynamic process. This process is the ongoing change in the node and place value and hence their relativity, which is being influenced by a range of decisions and responses. These responses are of course the product of a very complex system resulting from the action and interaction of factors such as policy settings, political action, market forces and economic conditions.

This idealised balancing functional relationship between the two variables is represented by the action of the transport-land use feedback cycle. This is a cycle which put simply states that any excess characteristic of a precinct stimulates balancing actions either through development or disinvestment (Bertolini, 1999, Wegener, 2004). The overarching dynamic or functional relationship inherent in the model and its interpretation into TOD is that station precincts will somehow ‘naturally’ strive for balance as indicated by the potential development pathways of the adjacent diagram in figure 1 (Reusser et al., 2008). For example in an unbalanced place scenario (where node/place < 1) the ‘natural’ response of this cycle is to either invest in and improve public transport functionality (for example service frequency) or to disinvest in place value (somehow decrease the land use intensity and/or diversity), or a combination of both actions.

In reality of course there are confounding factors to the ‘natural’ operation of this feedback cycle (Bertolini, 1999) and in addition, when a node is considered in the context of a complex urban system, it may not be efficient or practical for every station precinct to develop toward a balanced condition. In this sense the model and its balancing dynamic are an idealised process.

If however it is assumed that balance is the objective for any station precinct under investigation then an unbalanced state would in fact indicate a latent potential to reach this objective. What conditions would inherently support capitalisation of this potential? That is to say, even if two precincts are reporting identical conditions in the model (*node* and *place value*) what underlying factors may favour development of one over the other. If this information was available it could be used to better guide investment decisions aimed at achieving TOD. The complexity of the range of factors that can influence changes in node and place value is acknowledged (Chorus and Bertolini, 2011), and understanding these is well beyond the scope of this investigation. Are there however discrete and important parts to this system which can be defined to help develop this understanding?

One characteristic with a prospect of revealing the inherent potential of an unbalanced station precinct concerns the physical condition of that location – what may be termed its urban design characteristics or urban structure (Peek et al., 2006, Jacobson and Forsyth, 2008). This is particularly the case for unbalanced nodes in an urban growth context, where the balancing action is likely dependent on investments to improve *place value*. Such an outcome requires the construction of infrastructure, buildings and public spaces to attract and facilitate this use and occupation. In this scenario the underlying physical qualities of a place can give an indication of the suitability of a precinct to attracting and supporting the investment required to achieve this.

The following research focusses on attempting to define and measure this aspect of the physical condition of the station precincts, what is termed 'quality of place' (QoP); which could help inform the relative effort required to transition unbalanced nodes to balanced TOD precincts.

Method

The study initially reviews two aspects of current literature. One concerns the role of urban design and QoP in TOD projects and the other focusses more generally on the issue of design related public realm quality in urban environments. From this review an analytical framework is developed which identifies important spatial quality principles, represented by specific criteria, and then methods of measurement are developed to describe these.

In the final stage the measurements of the criteria are undertaken for 13 station precincts in the Perth Metropolitan area. The results of this are then analysed and compared to assess the validity of the framework for future development and application.

Literature Review

One aspect that is consistently reported in literature as supporting the functioning of a TOD is *high quality pedestrian realm* (Vale, 2015). TOD objectives are dependent on reducing automobile dependency and encouraging walking access to, from and between public transport stops, facilities and amenities. The length of pedestrian paths in a precinct thus can be inconsequential with respect to the quality of the journey (Speck, 2012). The pedestrian experience can however be gauged by its perceived conflict and relative priority with motor vehicles, presence or otherwise of active ground floor interfaces, permeability, legibility and the presence of trees and canopies and the condition and design of surfacing and street furniture (Borst et al., 2008, Lo, 2009, Foster et al., 2011).

More generally literature often discusses the concept of a *high quality public realm* as supporting TOD (Peek et al., 2006). The quality of the public realm can either be evaluated from the viewpoint of the expert or from lived experience. Whilst users are able to convey firsthand information, professionals are able to study more complex factors which require specialised knowledge. For example architects possess the expertise to communicate qualities of space and health professionals are able to link wellbeing outcomes from certain built environment characteristics. Therefore, to be robust, any framework for quality must allow both professional judgement and lay opinion. The following studies are used to help formulate the analytical framework.

A comparative analysis of the residential environment preferences surveyed in the Grattan Institute study *What Matters Most? Housing Preferences Across the Australian Population* (Weidmann and Kelly, 2011) and a similar study, *The Housing We'd Choose*, undertaken in Perth (Department of Housing WA and Department of Planning WA, 2013) sought to identify which public realm aspects were clearly confirmed as important for the majority of households from both surveys. This analysis confirms three key aspects of relevance to this study firstly the desire for neighbourhoods to be free from traffic congestion, secondly to avoid pollution and thirdly proximity to parks and natural features. Furthermore the *World Health Organisation Quality of Life* questionnaire (World Health Organisation Quality of Life Group, 1998) gives useful insights into key spatial factors which are associated with health outcomes. The most important physical aspects confirmed from this research again relate to exposure to traffic and pollution.

There is much research in the field of environmental psychology into residents' perceptions of the quality of their built environments - what is termed 'neighbourhood satisfaction' or 'perceptions of residential environment quality' (PREQ) (Amérigo and Aragonés, 1997, Sirgy and Cornwell, 2002, Bonaiuto et al., 2003, Marans, 2003, van Kamp et al., 2003, Bonaiuto et al., 2006, Kearney, 2006, Braubach, 2007, Hipp, 2009, Lovejoy et al., 2010, Buys and Miller, 2012). This work attempts to build assessment models based on a whole range of indicators which have been established through analysis and interviewing residents. This work tends to confirm the availability of parks and green

space and exposure to noise as the most important physical aspects of determining individuals' perception of the quality of their neighbourhood.

The LEED™ ratings framework for *Neighbourhood Development* (US Green Building Council, 2009) is useful when looking at the measurement of amenity aspects of mixed use neighbourhoods such as those supported in TOD objectives particularly as it attempts to define specific physical aspects which contribute to quality. This framework tends to support street permeability and connectivity, the presence of civic and public space, the presence of trees and shade as well as confirming the important aspects of walkability discussed previously - active ground floor interfaces, permeability, legibility and the presence of trees and canopies and the condition and design of surfacing and street furniture.

EnviroDevelopment™ is an assessment scheme for new urban developments developed and adopted by the Urban Development Institute of Australia (UDIA) and is aimed at documenting outstanding performance against six key project elements (EnviroDevelopment, 2014). Public realm quality for mixed use developments such as TOD is addressed in the *Community* element and identified with a principle described as *Engaging and Inclusive Public Realm*. The criteria used to meet performance against this principle relate generally to the adequate provision of public space, connectivity and permeability of the public realm, safety and comfort of users and to 'create locally distinct places which connect people through place and strongly reflect the local identity of the area' (EnviroDevelopment, 2014, Sec 6.4)

The UK Commission for Architecture and the Built Environment (CABE) was recognised as one of the world's leading professional organisations describing and evaluating urban design quality. The seven principles of good design give a good overview of the important physical aspects of a neighbourhood which contribute to quality in the urban sphere (Commission for Architecture and the Built Environment, 2011). In terms of the focus of this research these principles indicate building on and establishing a distinctive character, the availability of public space, prioritisation of pedestrians over vehicles and ease of crossing manoeuvres and the presence of landmarks as critical considerations.

Another physical factor which is reported in literature as having considerable influence over potential investment in place, particularly related to buildings, is the availability of suitably sized development parcels (Cervero and Landis, 1997, Searle et al., 2014). Small lots in existing residential areas pose difficulties in terms of assimilating higher density building typologies and are likely to be avoided. Additionally the amalgamation of individually owned lots is often a difficult and lengthy process which detracts from development attractiveness. Larger land holdings at least create the possibility of both a substantial and potentially economically attractive scale of development and the ability to manage integration with surrounding land uses. In addition a larger scale of development may be able to incorporate communal functions such as outdoor facilities and gymnasiums which the surrounding area may not yet provide. Although this is an important spatial indicator of development potential it does not directly form part of the Quality of Place argument and is therefore noted but not developed further in this paper.

Analytical Framework

A number of key elements and associated principles have been developed from the literature review and are presented in the table below. These represent a high order analytical framework for determining the physical elements of urban design quality of precincts.

What this exercise is attempting is to identify, through the investigation of a range of conceptual frameworks, is a series of principles which give a good first order appreciation of the physical condition of a precinct. It is therefore not exhaustive but uses principles which seem to be consistently reported across different frameworks or very strongly indicated as important. In order to utilise this framework a series of criteria and their measurement method need to be established which report on the performance against the principles.

Table 1: The Quality of Place (QoP) analytical framework

Element	Identifier	Principle
<i>Walkability & Connectivity</i>	W1	Manage barrier effect/conflict of pedestrians with motor vehicles
	W2	Ensure street networks are permeable
	W3	Provide shade and trees
	W4	Ensure buildings have appropriate active ground level frontages
<i>Public Realm</i>	P1	Provide public spaces
	P2	Presence of features which contribute to distinctive character/local identity
	P3	Presence of landmarks and public realm elements which contribute to legibility
	P4	Ensure vehicular traffic levels are appropriate to urban context
<i>Environment</i>	E1	Manage exposure to pollution
	E2	Manage thermal comfort

W1 Manage barrier effect/conflict of pedestrians with motor vehicles

Levels of conflict for pedestrian crossing locations are often calculated by transport authorities as a simple ratio of foot versus vehicular traffic volumes. This represents a significant analytical effort which is beyond the scope of this research. As a proxy it is proposed to calculate the gross length of *major road segments*¹ within the walkable catchment of the precinct and then to divide this by the gross floor area of building. This measure (*Roadscape Balance*) is in units of (m road length)/(1000m² GFA) and gives an indication of the dominance of major road infrastructure, which represents a potential pedestrian barrier, in relation to the intensity of human occupation.

W2 Ensure street networks are permeable

There are some established measures for determining street network permeability. The most commonly used one is to measure intersection density – that is the number of connected intersections² within a walkable catchment of the precinct.

W3 Provide shade and trees

The measurement of the amount and potential amount of shade provided has been calculated by documenting the gross coverage of tree canopy within the walkable catchment and then dividing this by the area of impermeable surface (*Hardscape Balance*). This calculation reports on the provision of shade as well as giving an indication of the potential to provide shade as an area undergoes land use development. For instance if there is an existing low proportion of tree canopy coverage in relation to hard surfacing then it becomes increasingly difficult and expensive to reinstate shade from trees. In addition this measure provides an indicator of the ability to manage local heat island effect (Coutts et al., 2009, Brown et al., 2013) (**E2**) as tree canopies provide substantial cooling of surfaces through shading and air mass through evapotranspiration.

W4 Ensure buildings have appropriate active ground level frontages

Active frontages are either commercial or residential uses which have been specifically designed to address the street engaging with the pedestrian realm and providing such benefits as passive surveillance and a stimulating environment. For commercial premises this generally equates to a proportion (50% or greater) of the façade, located sufficiently close to the boundary with openings which permit engagement. For residential uses an active frontage can be assessed by the provision of an active habitable zone fronting the street in sufficient proximity. In addition only residential uses which are compliant with a TOD objective are considered, which excludes single residential dwellings.

¹ A *major road segment* is defined as any separate carriageway which has 2 or more through lanes in one direction.

² A connected intersection excludes 3-way intersections where one leg leads to a dead end such as a cul-de-sac.

The length of active frontage within a walkable catchment is measured and qualified by dividing by the existing length of ground floor public frontage of buildings of commercial or residential use types. Station precincts in early phases of TOD maturity may have very little building development on the ground when compared to more established development patterns. This disparity is likely to skew results and make blanket cross comparison problematic. Therefore this measure is not included in the aggregate measure of walkability but indicated separately as it is still informative for individual locations.

P1 Provide public spaces

Much of the literature itemises public spaces, ranging from parks, boulevards, community gardens and civic plazas as key components of a TOD precinct. Rather than calculate the gross area of such facilities, which may overlook quality of smaller areas, a desktop and site assessment of the number of clearly legible public realm elements was undertaken. This tally gives an indication of the existing status of public space structure and whether or not there are good 'bones' for the grafting or extension of TOD.

P2 Presence of features which contribute to distinctive character/local identity

There are physical characteristics which substantially contribute to the character of an area, for example heritage buildings or landscape features which in turn can be enhanced in further development to strengthen a sense of place. In order to measure this a site and desktop assessment of the number of natural and/or manmade features and/or community based activities within an 800m radius which clearly define the distinctive character of the precinct was undertaken. Relevant features include heritage structures & places, aboriginal heritage places, community places, rivers, wetlands, town squares, sculptures and artwork, formal parks and bridges.

P3 Presence of landmarks and public realm elements which contribute to legibility

Significant buildings and well understood public realm typologies such as plazas and parks provide the means by which people can orient themselves in an urban environment. This allows people to feel comfortable and more easily utilise public areas for meeting and carrying out a range of activities. The calculation of this degree of legibility overlaps with the method proposed for principle **P1**. A separate measure is not required however the importance of this value is emphasised and its value is duplicated to construct aggregate scores.

P4 Ensure vehicular traffic levels are appropriate to urban context

This principle is attempting to ascertain the level of vehicle dominance of the walkable catchment of a precinct. Similar to the previous principle a method of measurement which reports on this has already been established (see *Roadscape Balance W1*). By normalising the extent of the major road network against the development intensity of an area a degree of perceived balance is introduced. For instance a large amount of vehicular traffic in a highly urbanised area (for example consider a city centre) could be perceived as appropriate whereas an environment such as a station located adjacent to a freeway interchange, with little surrounding land use development, would be perceived by a pedestrian as dominated by vehicles. This indicates both the current condition in relation to striking a balance between vehicles and pedestrians as well as the likely effort in overcoming an entrenched urban context. *Roadscape Balance* is therefore adopted as the measure for evaluating performance against this principle.

E1 Manage exposure to pollution

Exposure to pollution is consistently reported across different conceptual approaches to urban environment quality as a very important consideration. The most significant pollutants in an urban environment relate to noise, soil, water and air quality. The pollution of waterbodies and soil is highly locational specific and difficult to measure in an average sense. Away from intensively polluting industrial uses, with which it is unlikely to co-locate a public transport station, noise and air quality is closely related to the amount of vehicular traffic. In these contexts, it is difficult to estimate air quality directly, however noise levels from traffic can be used as a proxy for air quality as large amounts of vehicle noise would indicate an increased probability of exposure to airborne pollutants from the operation of motor vehicles.

Noise levels for station precincts were calculated using a transport noise adjustment factor applied to a general ambient condition, using a method adapted from Assigned Noise Levels calculations of the Environmental Protection (Noise) Regulations 1997 WA. This factor was then reduced by an Urban Intensity Factor which considered the relative area of commercial land uses within each of the immediate and extended areas and reflects the adjustment to user's perception of exposure that

comes from being in an active urban area. The value is then reported as an overall noise level adjustment to the ambient condition dB(A)(daytime).

E2 Manage thermal comfort

This principle is important for urban environments which are consistently subject to temperature extremes. This analysis focusses on urban heat, which is of relevance for the Western Australian context under investigation. Aspects of microclimate and the ameliorative influence of trees and shade have been addressed under the *Hardscape Balance* calculation of **W3**. This value is therefore utilised in the aggregate scoring of this criteria.

In Western Australia maximum summer daytime temperatures and the cooling potential of the prevailing sea breeze are important factors related to thermal comfort. That is not to say that development is limited to more pleasant thermal environments, but these factors give an appreciation of the effort required to overcome the natural extreme condition of a location. Accordingly a measure of thermal comfort has been derived which sums the relative normalised value of the average maximum temperature and frequency of a 3PM sea breeze of moderate strength or greater during the period January and February using Bureau of Meteorology and Department of Environment and Conservation (WA) weather station records.

Measurement – a case study

Perth, in Western Australia, has strategic planning directives toward establishing or intensifying urban development around certain passenger rail stations in line with TOD objectives as part of its broader strategic plan to develop Activity Centres (Western Australian Planning Commission, 2010). The measurement method described above has been applied to 13 of these station precincts within the metropolitan area (figure 1). The objective of this is to investigate whether the criteria that have been derived from theory support the empirical evidence and provide a reliable first order estimation of the Quality of Place with respect to TOD. If this is the case then the framework could be further developed and used to assess unbalanced station precincts with respect to spatial quality and ultimately provide some guidance on investment strategies toward achieving TOD.

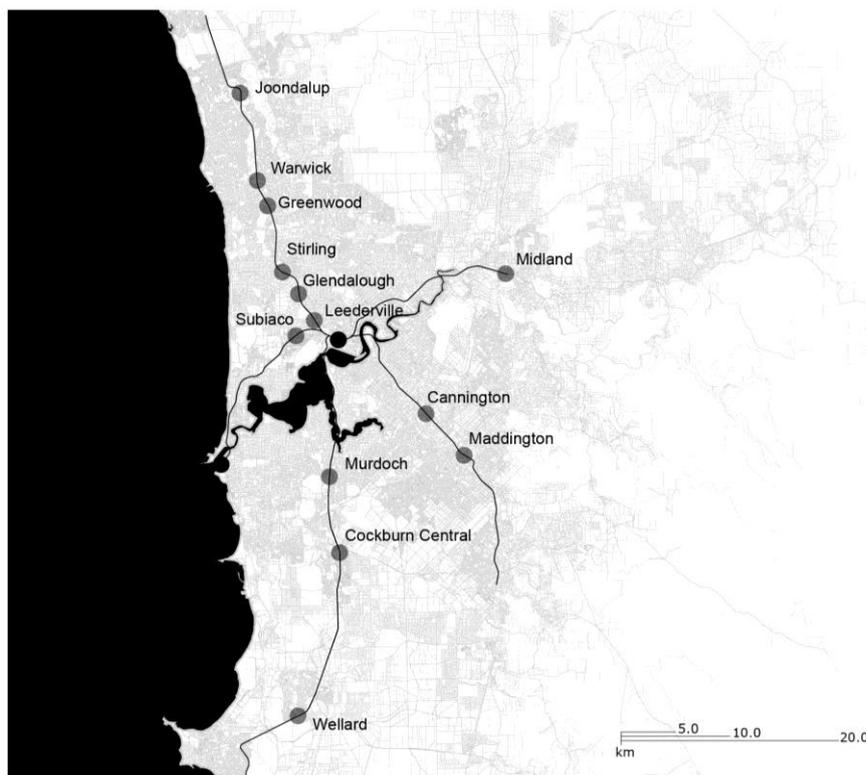


Figure 1: The 13 station precincts along Perth's passenger rail network used for measurement

The stations precincts represent different typologies and stages of development maturity. The typologies are determined principally according to their relationship with major road infrastructure (Babb et al., 2015). *Heritage* precincts are situated within the general urban fabric away from controlled access freeways and highways, *Interchange* precincts have stations located within a

freeway median and are combined with a freeway road interchange (on-ramps etc), *Freeway* precincts also have stations located within a freeway median but are not associated with a road interchange and *Divergent* precincts have stations which are part of the combined freeway rail system but where the rail alignment has been deviated to provide a station in an adjacent location (figure 2).

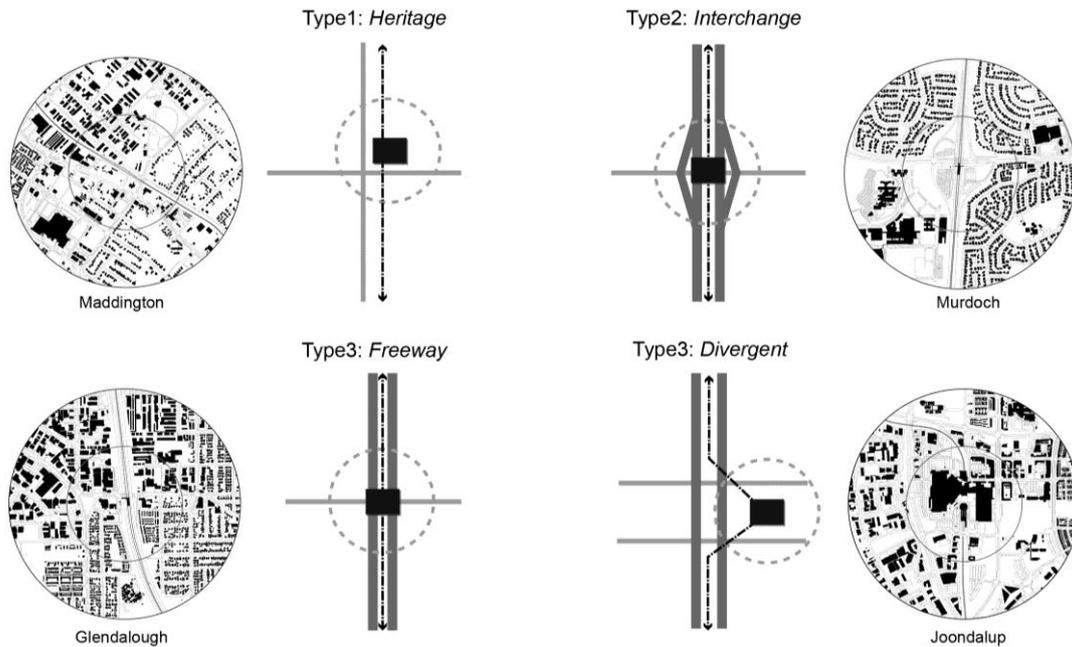


Figure 2: The station precinct typologies and examples with 800m radius catchment examples

In addition, even though some measurements have been qualified against their respective land use intensity to try and remove the bias of the different development maturity of precincts it is acknowledged that this could still influence results and should be taken into consideration in further research. The station precincts, their typologies and development stages are indicated in Table 2.

Table 2: The 13 station precincts and their development stages

Typology	Station/Precinct	Id	Development Stage
<i>Heritage</i>	Cannington	CN	<i>Preliminary</i> : structure planning is advanced although there is no transit oriented development 'on the ground'
	Maddington	MD	<i>Conceptual</i> : there is no formal local planning or transit oriented development
	Midland	ML	<i>Foundational</i> : there is local planning and some transit oriented developments 'on the ground'
	Subiaco	S	<i>Mature</i> : there is substantial well established transit oriented development constructed and operational
<i>Interchange</i>	Cockburn Central	CC	<i>Established</i> : there are numerous, yet evolving transit oriented developments
	Murdoch	MH	<i>Conceptual</i>
	Stirling	ST	<i>Preliminary</i>
<i>Freeway</i>	Glendalough	GL	<i>Conceptual</i>
	Leederville	LV	<i>Preliminary</i>
	Warwick	WK	<i>Conceptual</i>
	Greenwood	GW	<i>Conceptual</i>
<i>Divergent</i>	Wellard	WL	<i>Established</i>

	Joondalup	JP	<i>Established</i>
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The individual and aggregate values of the measurements have been normalised and equal weightings applied. Normalised values are given a positive correlation such that 0 is the least performing and 1 is the highest performance. Raw scores have been checked to detect any extreme values which could skew the normalised results. The results of this preliminary measurement round are presented in the figures below.

Discussion and Analysis

It is not intended to present an exhaustive analysis of the stations but to gauge the authenticity of the analytical method. Further scrutiny, analysis of the potential implications for TOD at such locations and methodological development will be the subject of future research.

The walkability measures generally support the perceptions and experience of moving around the station precincts on foot (figure 3). The highest performing precinct is Subiaco which retains the qualities of an inner urban village. The detrimental impact of major road infrastructure on walkability is confirmed by the poor performance of the *interchange* precincts and the relatively good performance of the *divergent* locations. Individually the poor performance of Cockburn Central reinforces one of its major criticisms and challenges as a TOD as it currently stands. Leederville is however confirmed as a good performer consistent with its urban character and the relatively pleasant environments away from the freeway of places such as Warwick and Greenwood is also supported. The active frontage values however add another dimension to the interpretation of results and provide useful data for scrutiny in further research. Overall it would appear that the analytical method is providing reliable results.

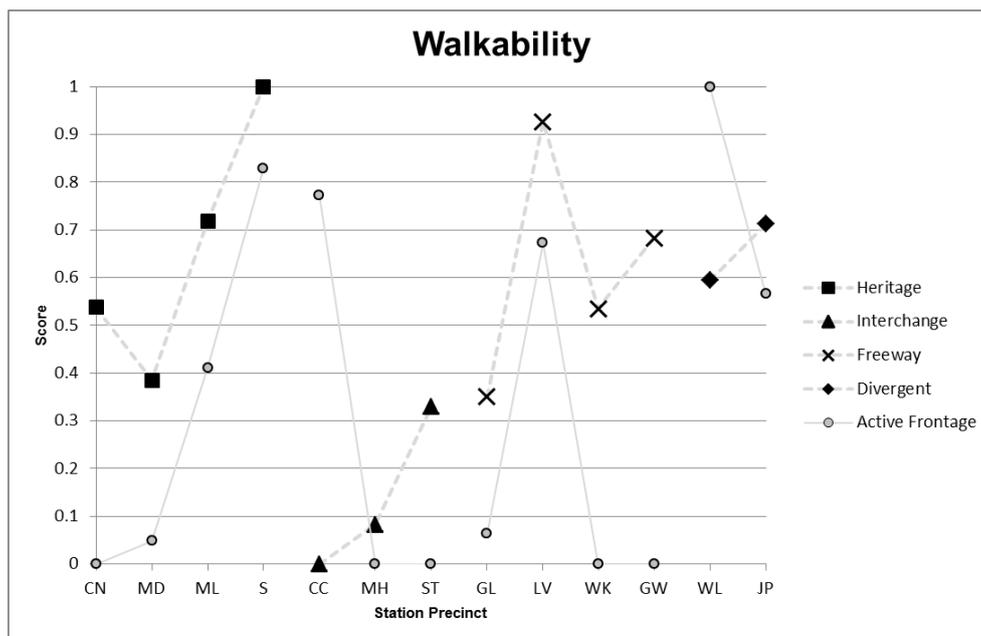


Figure 3: Walkability measurement results

In terms of public realm it is encouraging to see that the locations that would be instinctively assumed as possessing a good public realm structure both score the highest (figure 4). Subiaco (1.0) is a purposefully designed, mature TOD precinct and parts of Leederville (1.0) have developed with the character of an inner urban village. There are also some correlations between the precinct typology and the public realm score. In particular the method confirms the detrimental impact of excessive major road infrastructure at the *interchange* locations on the quality of the public realm. *Divergent* locations would be expected to perform well, as they have the opportunity to integrate the station precinct although much is dependent on their development maturity and commitment to a TOD urban structure. This is evident from Joondalup (0.35) which has a relatively poor urban structure within a walkable catchment compared to Wellard (0.72) which has been deliberately planned with TOD principles.

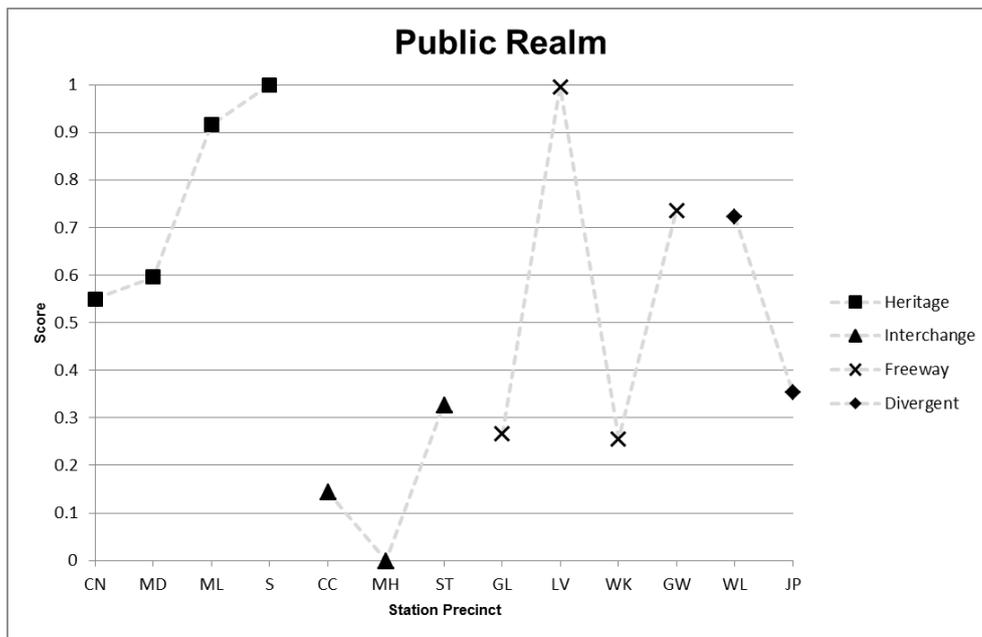


Figure 4: Public Realm measurement results

The environment measures also tend to endorse expectation and experience (figure 5). Pollution levels are substantially impacted by the presence of freeway infrastructure and thermal comfort is closely related to proximity to the coast. The results would tend to confirm the success of Subiaco (0.98) as a TOD precinct from an environment perspective and also support the positive environmental characteristics of divergent station precincts along the Perth-Mandurah line which runs parallel to the coast. Another correlation is the positive environmental characteristics of station precincts along the ‘coastal’ freeway, yet not adjacent to a freeway interchange, which retain an older 1960-70s suburban land use pattern. Aside from the locational benefits already discussed these established suburbs with generous lot sizes afford extensive tree canopy coverage in relation to constructed impermeable surfacing which mitigate some of the environmental challenges. In addition it is apparent the overall environmental performance of the heritage locations, which lack coastal proximity, is offset by their more positive pollution context.

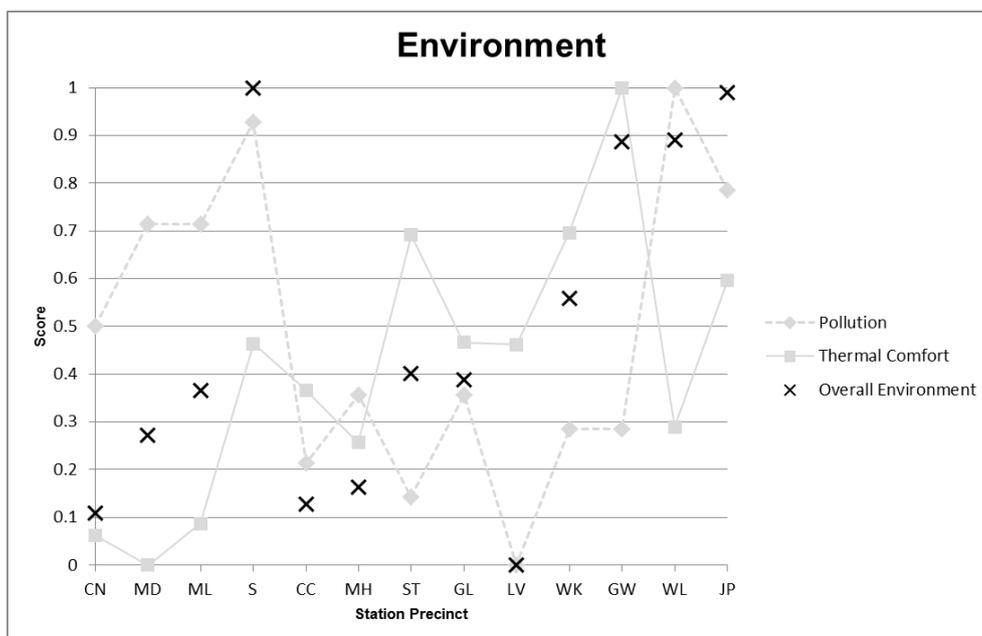


Figure 5: Environment measurement results

The unweighted overall Quality of Place scores, combining walkability, public realm and environment reinforce some of the trends described under the measurement of individual principles (figure 6). Subiaco, the mature TOD village, is encouragingly rated highest. The divergent stations also perform

well as to be expected as the negative impact of the proliferation of major road infrastructure is substantially avoided. Accordingly station precincts which have to negotiate the complex vehicular traffic organisation associated with freeway interchanges remain in a position of poor performance with respect to Quality of Place.

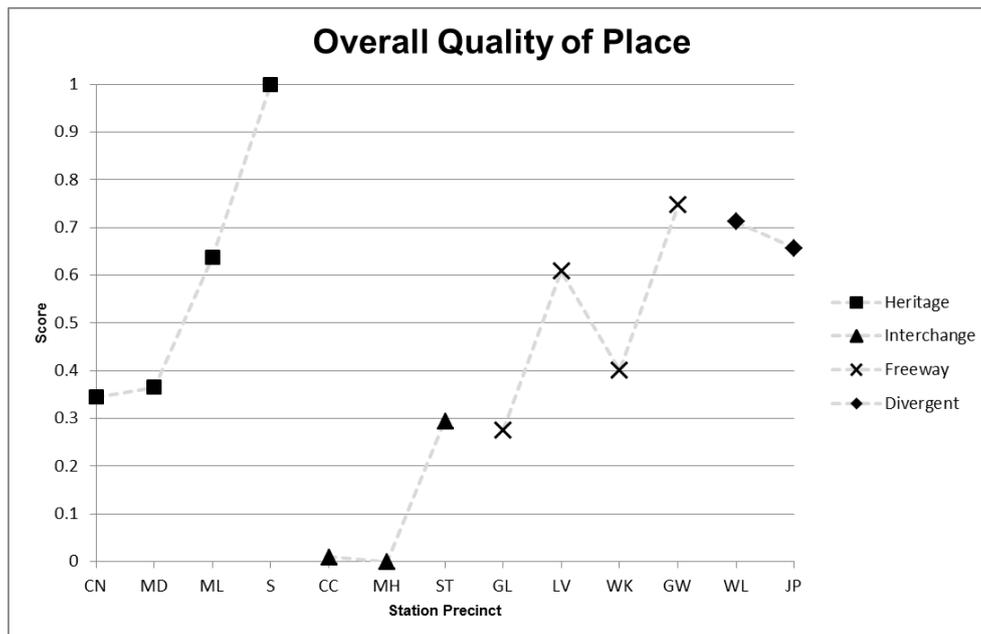


Figure 6: Overall Quality of Place measurement results

Conclusion

Overall from a preliminary assessment of its application to 13 station precincts in Perth at various stages of TOD maturity the analytical method appears sufficiently validated to warrant further scrutiny and development. Weighting scenarios and a more detailed investigation of the results in relation to the sites that have been measured would be a useful first step. In addition sites from different cities would expand the validation and no doubt lead to refinements. Nonetheless the results are encouraging and the method could, after further research and development, provide a reliable first order estimate of the Quality of Place of a TOD precinct. This promises to be very useful in assisting with decisions regarding the prioritisation and types of investments needed to stimulate TOD, particularly those which would require upgrades to the spatial qualities (unbalanced places) within an urban network. More broadly it could also be used to identify which precincts have an underlying urban structure which inherently supports TOD and inform public and private development efforts in a more effective and efficient manner.

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