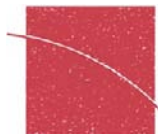
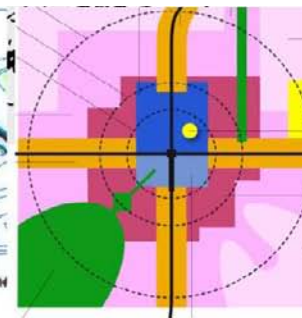




# TOD

Putting **Transit Oriented** into **Development**

Peter Richards: Director DEICKE RICHARDS



Architecture  
Urban Design  
Community Design

DEICKE RICHARDS

Law and Finance Third Annual Urban Design Symposium July 2006 Peter Richards



## Putting TO into D

This paper presents a number of conceptual tools that explain principles of Transit Oriented Development and their location, type and form within urban settlements and regions. Recent case studies demonstrate how these principles are applied to particular places within South East Queensland, at Caloundra and Springfield on two of the proposed railway lines identified within the Regional Plan. The workshop process is described and reflected upon to show how complex problems such as the design of TOD's can be creatively addressed to achieve better design outcomes for transit oriented development.

The aspirations for and principles of Transit Orientated Development (TOD) are well embedded in our present design values, almost to the point of orthodoxy. Urban design terms such as compactness, diversity, density, fine grained mixed-use, permeability, walkability and high quality public realm, readily roll off the tongue and appear in almost every planning document that has been written over the last fifteen years. We can now readily describe what TOD is and should be, but converting these principles into built places is more of a challenge as the urban development juggernaut continues its titanic course.

In greenfield areas, there remains a lingering belief that low density, car dominant, suburban design responses are acceptable, often argued on the basis of affordability and market preference, with 'urban' only a concept for existing urban areas.

The provision of major public transport investment provides an incentive to aspire and deliver TOD and more urban outcomes in greenfield areas. There is also a responsibility for the development to support this significant public investment.

The Park Meadows Mall in Denver in the US is one extreme example of a place that exhibits absolutely no characteristics of TOD. The Mall and surrounding areas are arranged as large lumps of development that have landed on the landscape indifferent to any street and neighbouring development. The non-TOD attributes of these 'edge nodes' are disconnected, inaccessible, soulless places with not a house in site, hanging off the junctions of highways. This 'geography of nowhere' and 'placelessness', to borrow from Kunstler and Relph, is a waste of investment and land. But they are still built.

While Australia does not suffer from these extreme urban development patterns, Robina at the Gold Coast has similar characteristics to the Denver Mall and struggles to be a TOD. There is a distribution of uses but in large lumps. The railway station sits uncomfortably and ambivalently on the edge, closer to a high school, rather than helping anchor the centre. The station's own park and ride, drop-off areas and bus interchange are very land consumptive and push development away. Even the public transport does not want to integrate to catalyse a TOD. The fine-grained richness and subtlety of more traditional places is not evident.

But the development industry tends to be divided







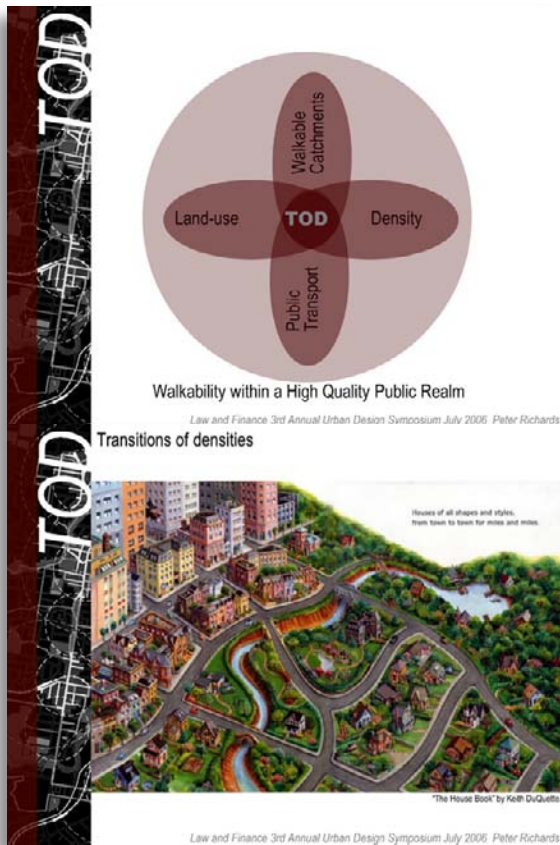
into development types. There is a complete industry supporting the development of individual housing within suburbs represented by the HIA. There are shopping centre developers, commercial developers and separate medium density housing developers. There are very few mixed-use or TOD developers. This reflects the lumpy development outcomes of the Denver Mall and Robina and is illustrated by an overlay study of the Rochedale project.

In developing areas, the development industry is now very good at recognising riparian corridors and drainage lines. The housing industry is very good at carpeting the rest of the land with good quality relatively low-density housing on slightly more interconnected street networks. The AGDF can deliver excellent sustainable housing at 11 dwellings per hectare. The (blue) shopping centre is usually located on the most car accessible part of the site, within a kilometre or two of housing, often with a green buffer, but is unlikely to have much employment and a good public transport service.

Overlaying neighbourhoods, based upon a walkable catchment of five minutes or 400 metres, the development pattern can change. Development conceived and designed as a neighbourhood delivers opportunities for some more variety and higher density housing around the neighbourhood centre that may contain shops, community facilities, employment and a place for the bus to stop. This is the first element of TOD.

But it is the incorporation of larger mixed-use centres into greenfield areas as TOD's that encourages more housing diversity and density, employment opportunities, retail, community uses and a place for the buses and the trains to interchange. Higher density mixed-use corridors can connect to the next neighbourhood. These patterns underpin a more sustainable urbanism.





## CONCEPTUALISING TOD

Deicke Richards has undertaken a number of projects and developed some conceptual and analytical tools to better understand and communicate the issues of achieving TOD within more sustainable urban outcomes. TOD combines the issues of land-use, density, walkable catchments and public transport in a high quality public realm.

A TOD is not a project or a development but a place. It has a range of catchments that may have a number of uses within each catchment. Three catchment scales are commonly used:

- 3 minute walk, 250 m radius and 18 ha catchment
- 5 minute walk, 400 m radius and 50-60 ha catchment
- 10 minute walk, 800m radius and 200 ha catchment

The general land-use locations are as follows:

- Employment areas within 250 metres of the station
- Retail within 400 metres
- Higher density residential 400 metres
- Medium density residential 800 metres
- Community facilities 400 metres
- Large-scale community uses such as high schools 800 metres

A TOD also has a range of development intensities within. Locating a range of uses, development intensities and building forms from individual houses, townhouses, and small and larger scale apartments within these catchments is the design challenge. The question of how much, where and

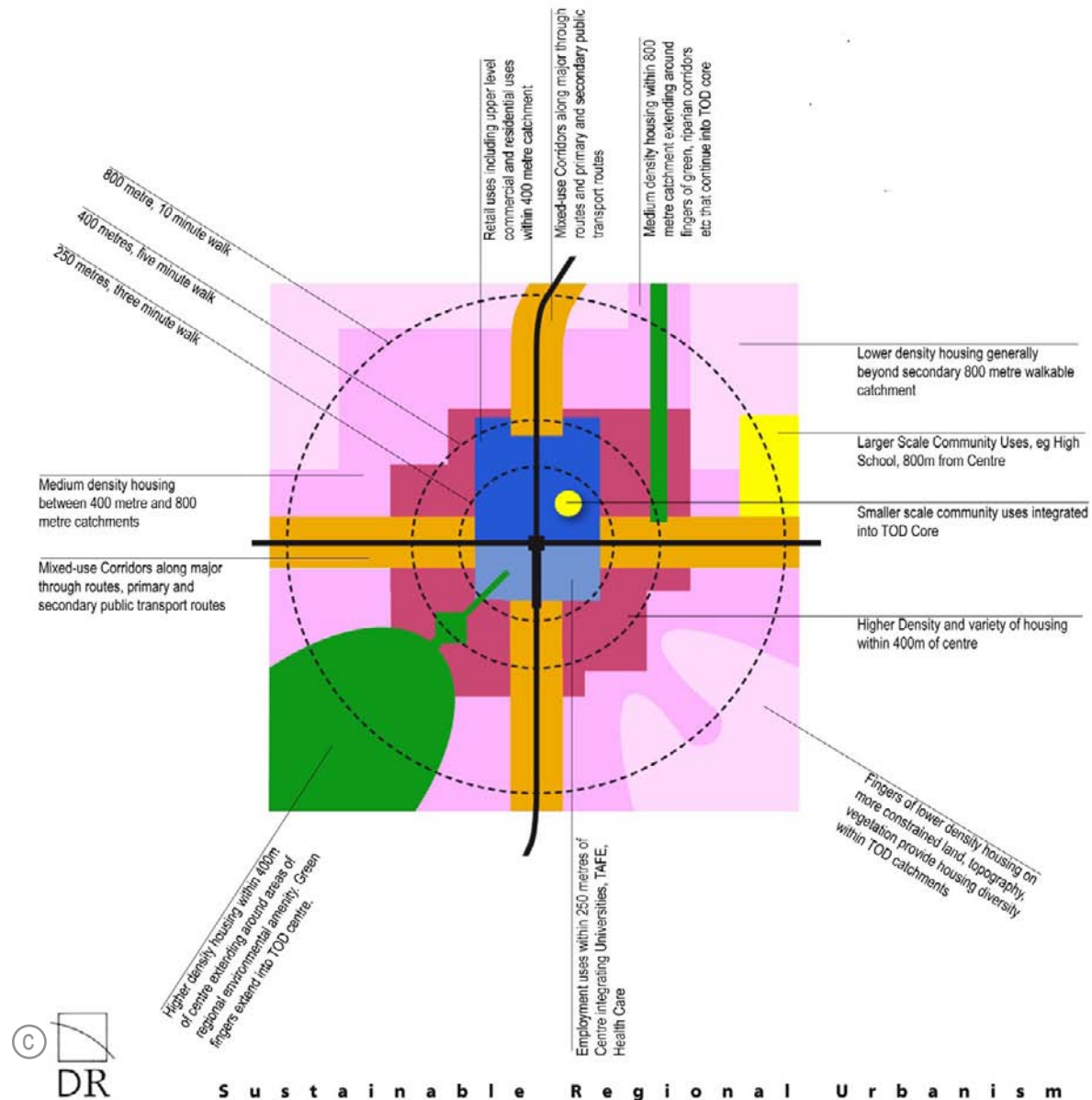
why of each development intensity and land-use is significant as is the transition of higher to lower densities. This dilemma is captured in this simple illustration from a children's book, which shows a transition from a city centre to a suburban edge, although the transitions from least dense to most dense are somewhat blunt. In a TOD there is a need to find a place for all development forms and intensities.

Deicke Richards own interpretation of these principles is demonstrated in a diagram of development forms of various densities, which range from 200 du/ha to 10 du/ha. At the denser end of the scale are six to eight storey apartments, transitioning to lower-rise apartments, terraces, small lots etc; with heights of 6, 4, 3 and 2 storeys.

At the less dense end are densities of around 11 du/ha, sadly where the 'sustainable houses' are found. The size of the square represents the comparative land area to achieve to the same quantity of dwellings. The densities are net, based on site area and reflect simple building typology of development forms. A TOD provides the rationale to incorporate this range of densities within one integrated community.

## CONCEPTUALISING SETTLEMENT FORMS

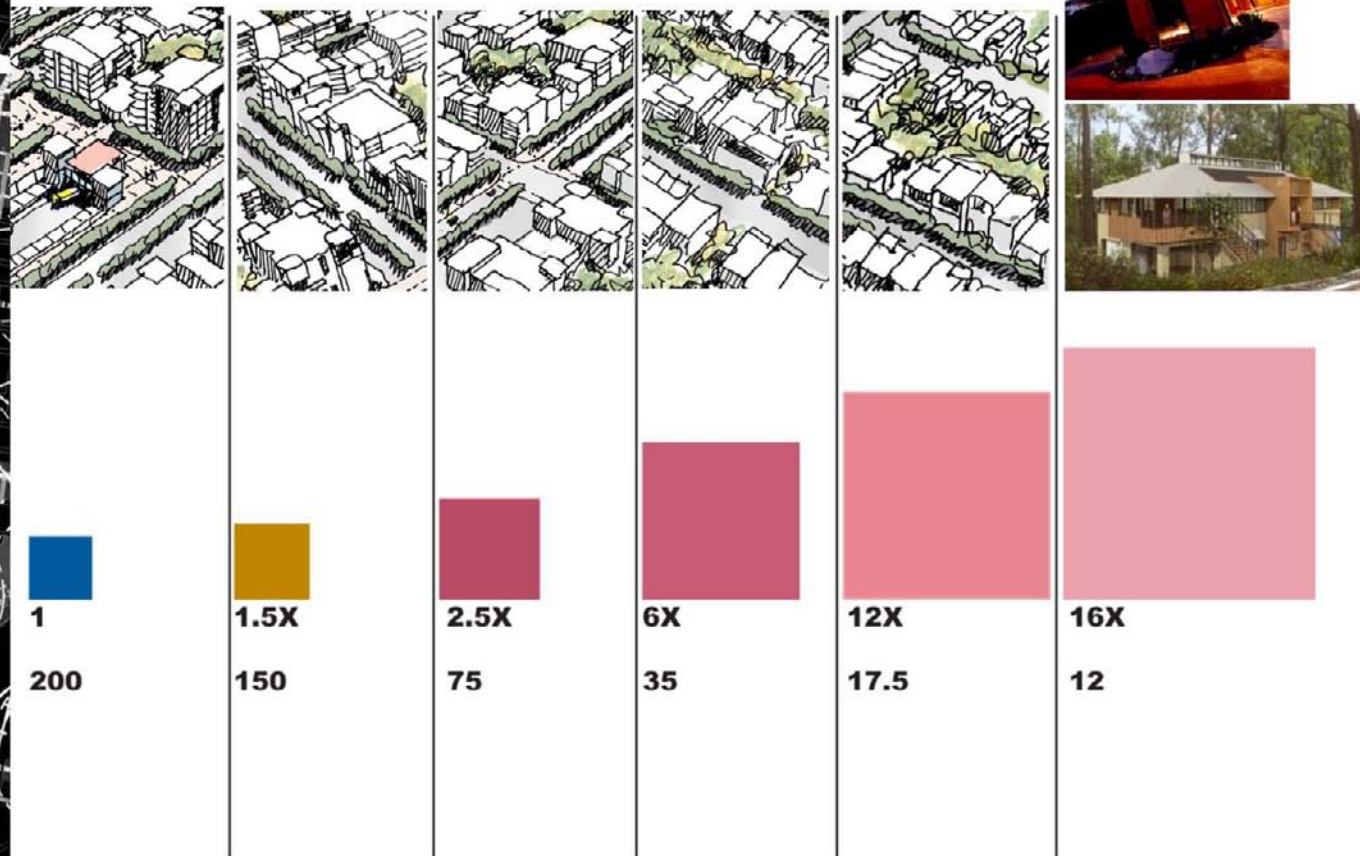
So how can this settlement form be conceptualised? Work by Deicke Richards on growth management strategies for Local Authorities has advocated five settlement types, the (sub)Regional City, Large







## Density and relative site areas

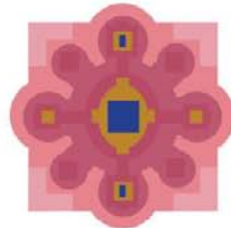


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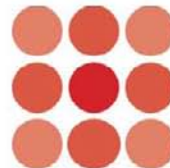
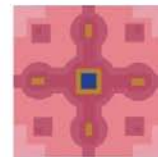


## Urban Settlement Types

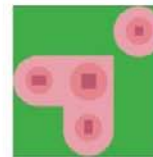
Regional City



Large Town



Township



Large Corridor



Small Corridor



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Town, Township, a Large Corridor and Small Corridor, all of which are transit supportive. The diagrams are configured as clusters of five and ten minute walkable catchments that are then overlaid with the colours of the density gradient to create 'idealised' settlement forms with the highest densities in the biggest centres and along the strongest corridors. The flower pattern makes them more beguiling and evocative images.

The largest 'idealised' form is the **(sub)Regional City** that has a large walkable centre scaled upon 800 metre catchment with a cluster of up to eight or so inner urban neighbourhoods surrounding, scaled on a 400m catchment. Within the primary catchment of the Main Centre, base densities would be 50 du/ha with up to 200 du/ha within the core. The supporting neighbourhoods could have different intensities. 'Corridor' neighbourhoods on the primary public transport routes have moderate densities with these densities continuing along major vehicle and public transport thoroughfares towards the city centre. These neighbourhoods have densities of 12-20 du/ha with up to 100-200 du/ha in the centre. Smaller neighbourhoods have areas of lower densities on their periphery away from the Regional Centre with small areas of up to 50-100 du/ha within the centre.

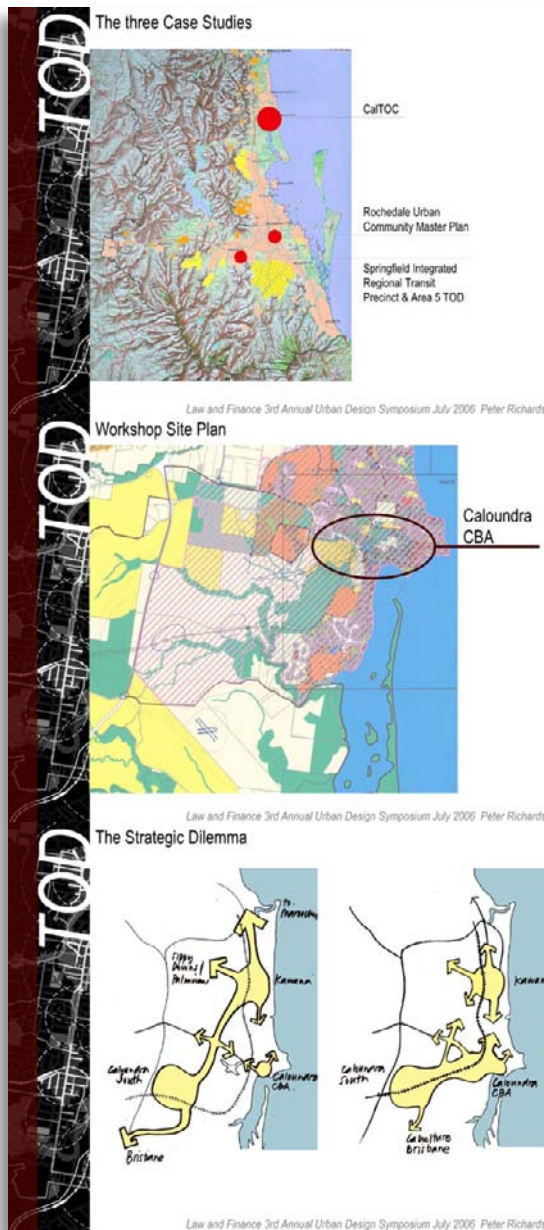
The **Large Town** has a centre neighbourhood and surrounding inner urban neighbourhoods, all scaled on the 400 metre, 5 minute walkable catchment. The surrounding neighbourhoods have similar configurations to the Regional City. The **Township** comprises a smaller cluster of neighbourhoods,

within a landscape setting, spaced and located along major through roads and in response to topographical constraints. Densities are generally lower, < 12 du/ha with up to 50 du/ha within centres.

The **Major Corridor** focuses on a high quality and high frequency public transport route such as heavy rail, bus transitways or light rail. The corridor is a continuous urban settlement form based on a 400 metre distance from the public transport route, with a series of TOD's along it scaled on a 10 minute walkable catchment, similar in configuration to the regional city. Each TOD may have a different role within the region, with retail, residential, community (hospital or university) focus.

The **Minor Corridor** is the focus of the lower order public transport. The development corridor is based on a 3 minute catchment with smaller scale TOD's based on the 5 minute walkable catchment. The base density within each neighbourhood is between 25-50 du/ha with an average of 75 du/ha towards the edges. Centres could include development forms up to 200 du/ha. Some TOD's within the corridor may be larger where significant crossroads or other corridors connect. More appropriately the corridors connect large and small towns to each other and to the major city centre.





## CASE STUDIES

Deicke Richards have had strong design roles in three recent projects which make TOD principles explicit, in a place based way. These projects are the Caloundra Transit Orientated Community (CalTOC), the Springfield Integrated Regional Transit Precinct and Rochdale Urban Community. All projects are in effectively greenfield areas. Two are on proposed rail routes with new stations, the other is a short bus ride from the Eight Mile Plains Southeast Busway station. One is promoted by a private developer, the other two by the local authority. All are critical for a more sustainable future for the South East Queensland Region and all were designed during Enquiry-by-Design workshops.

## CalTOC

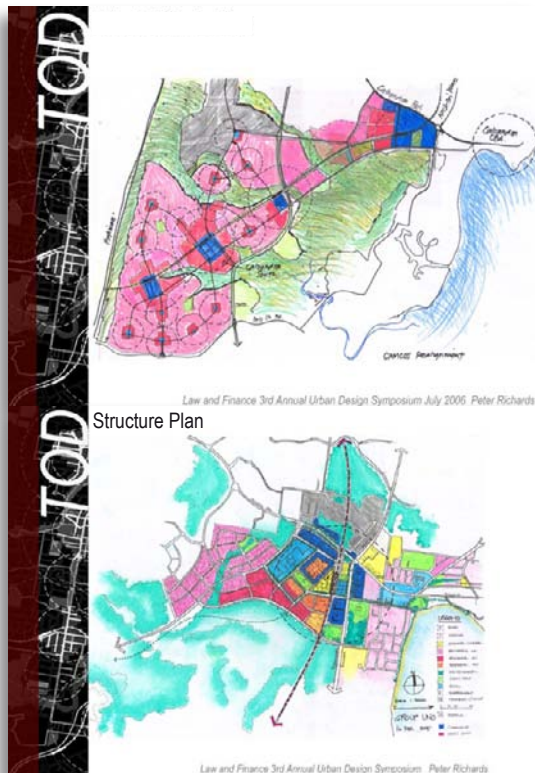
The Caloundra Transit Oriented Community (CalTOC) investigates opportunities for Transit Oriented Development around the proposed Caloundra CAMCOS station. To understand these opportunities, CalTOC investigates a larger study area which commences at the western half of the Caloundra Central Business Area (CBA) and extends about ten kilometres south and west to Caloundra South. The western border is the Bruce Highway. Industrial and residential development is located to the north and sensitive coastal environmental areas are found to the south and east.

The study area is predominantly a single land holding by national developer, Stockland with the potential of creating a new settlement for 70,000 plus people. The eastern end of the study area

also happens to be a functioning small airport, in government ownership. A new rail line from Beerwah to Maroochydore, known as CAMCOS is planned to traverse the area. A proposed Multi-Modal Transport corridor extends southward from the Sunshine Coast Motorway through the centre of the study area which will provide strong road linkages from Caloundra South to the Kawana Town Centre and Maroochydore to the north.

In order to better understand the issues of the land use and transport integration of the region, an Enquiry-by-Design workshop was chosen as a way to bring a range of interests together and enable a number of comfortable and provocative design scenarios to be explored. The workshop was convened by QT, Caloundra City Council and the Urban Design Alliance (UDAL) in December 2005. The outcomes were not binding to any group and remain so at present and work completed does not represent policy of Government or Council. This was important for the workshop to occur at all.

Three scenarios informed the design investigations. The first had existing transport corridor commitments and land uses respected. The second option respected existing transport corridor commitments but allowed future land use opportunities to be explored and the final approach allowed the transport corridor location and land uses to be reviewed. In developing these scenarios, the design teams worked at various scales. Structure plans for the entire region were drawn at 1:10,000 with opportunities for appropriate TOD around each proposed station location explored by all teams.



Development catchments were compromised by the location of the development footprint in relation to environmental areas, lower flood prone land and waterways. The placement of the rail corridor in relation to these areas, the required geometry for curves on the rail corridor and the spacing of stations added further complications. The scenario showing a new CAMCOS alignment was the most provocative option as it created a strong southwest to northeast connection from Caloundra South to the CalTOC precinct and identified potential for up to four to five stations within the development footprint.

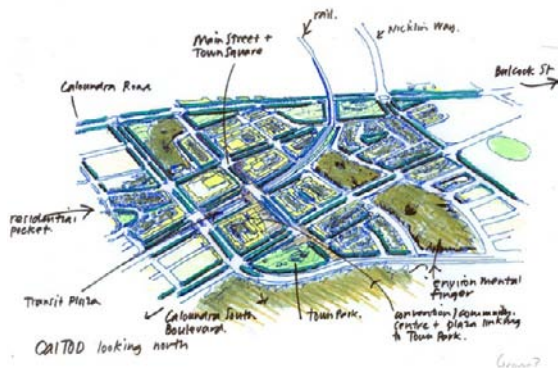
In all options, the Town Centres, drawn at 1:5,000 or 1:2,500 were configured as significant TODs. In the realigned option, the railway line arced through the study area with the required one kilometre radius. The station needed to be on a straight at the end of a curve, not in the middle of one, which placed it inland from Caloundra Road. Important vegetation was retained and created opportunities for urban amenity.

The design for the TODs across each option followed well understood urban design principles as they applied to the site. A broad mix of uses was anchored by a fine mesh of streets. The retail core focused on cross main streets linking the station to the surrounding street network and towards the existing centre. Employment areas were located along busier streets and facing the rail corridor with good exposure and access. Residential precincts were on quieter streets overlooking green spaces. A bus interchange was located next to the station

with associated public plazas, with civic uses integrated. The Town Centres were built up and over the station, to avoid basements, as the water table was high, and enabled easy street connectivity over the railway line, or the rail was elevated. It was important that the rail did not act as an actual and physical barrier within the TOD. A high degree of pedestrian and cycle accessibility and connectivity within a high quality public realm was consistent in all options and fundamental objectives of a successful TOD.

The workshop provided a wealth of information for Caloundra Council and the State Government to consider and better understand the choices in relation to major government investment. A central issue concerned the role of heavy rail within a local region. The location of the rail in relation to the development footprint, the spacing of stations for an efficient service and the extent of the development footprint required additional public transport to be incorporated, probably with buses. The proposed major road infrastructure of the Sunshine Coast Motorway extension provided a perceptual relationship between road infrastructure or rail as the primary means of connectivity in this future region and the resultant emphasis on the various centres within the region including the existing Caloundra CBA.

The workshop outcomes were well received and these investigations are ongoing.





## SPRINGFIELD INTEGRATED TRANSIT PRECINCT

Springfield is a fast growing new city of 70,000 people about 30km south west of Brisbane. For 15 years or more, the development has been predominantly residential with significant projects by development partners Medallist at Brookwater and Delfin Lend Lease at Springfield Lakes. The city centre is starting to emerge with the major new street through the city, Sinnathamby Boulevard, and highway interchange under construction. A university and major shopping centre are opening in 2006. The South-East Queensland Regional Plan 2005-2026 proposes a heavy rail extension to Springfield with the rail corridor and a station adjacent to the town centre, but in the middle of the highway. This transport corridor is potentially 120 metres wide with the pedestrian access to the station a long tunnel.

The town centre is immediately to the south of the Centenary Highway with a large predominantly

residential area, Area 5, to the north. Springfield Land Corporation has investigated concepts for a high-density residential uses within this precinct incorporating up to twenty storey buildings in order to create a large residential population close to the town centre and railway station.

The city centre is on relatively flat land next to a creek, which forms a significant town park through the centre and bounds it to the east before carrying northwards under the Highway. High ridgelines form vegetated edges to the north and west. There is more of a slope along the transport corridor with the land sloping up from the park on the east where it is seven metres below the Highway to Sinnathamby Boulevard to the west where it bridges seven metres over the Highway.

Recognising the opportunities and responsibilities of significant public investment in high quality public transport for the city, Springfield Land Corporation and its development partners investigated design potential for the station to form a key component



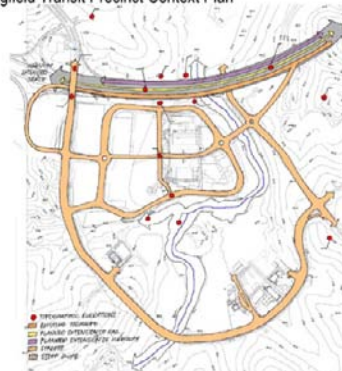
Springfield Context Plan



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Springfield Transit Precinct Context Plan



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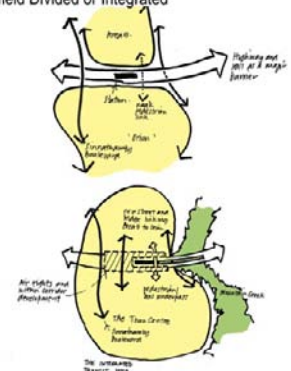
Springfield Current Site



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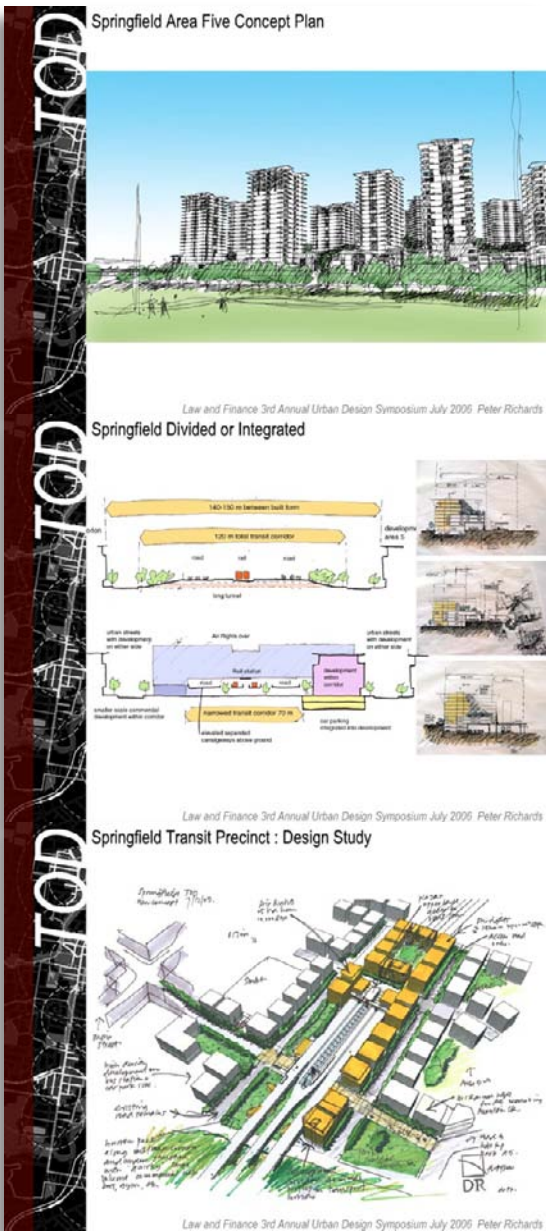


Springfield Divided or Integrated



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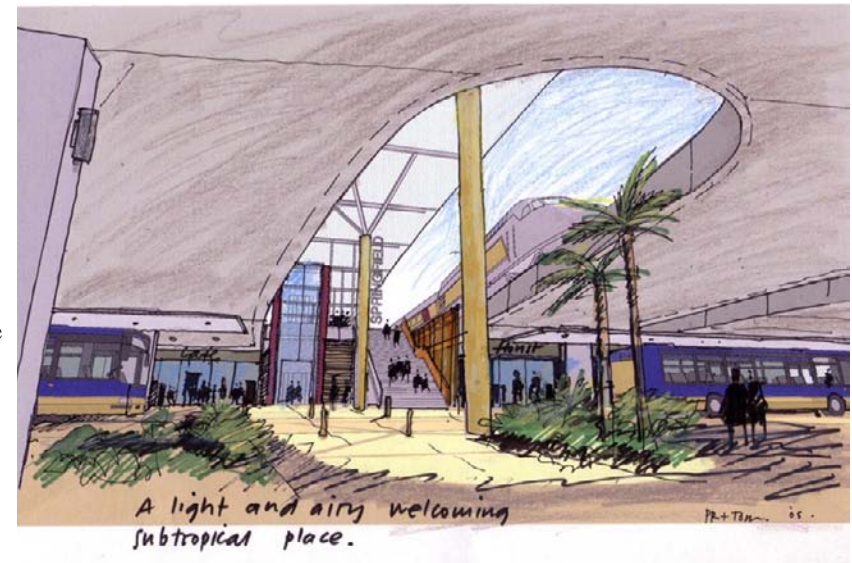
of an integrated transit precinct. This was undertaken in a weeklong design workshop with a design team that included in-house Springfield staff, development partners, architects and urban designers ZGF from Portland, Oregon and Deicke Richards as a local office.

One of the essential issues was overcoming a potential barrier of the wide corridor that separated the two development areas in order to create an integrated precinct within one larger area. The response was to locate the station where it could be accessed from below on the east and above from the west and to use an elevated structure for the road and rail as it approached the city from the east. This allowed the park to extend into the heart of the transit precinct. Idiosyncratic commercial uses such as small shops, bars, gyms, cafes, etc were inserted within this space under the structure while allowing views and access through and around.

The pedestrian access to the station and between each development area widened and became more welcoming. The bus interchange was located next to the station under the structure, rather than across a street within the adjacent retail centre. Development as air rights at the western end and within the corridor on both sides created development sites and better possibilities for the precincts north and south to be integrated around the station.

The potential subterranean character of the elevated structure was studied through modelling on computer. The attempt was made to create generous

wide spaces within compressed heights but to utilise the gaps between the structures and voids above to allow in light and air and grow plants. The station entrance at the end of the platform has the potential to make a welcoming subtropical place with a dramatic view down into the forecourt and bus interchange from above. The opportunity is for each precinct to now positively address the station area, not turn their backs on it and build a stronger case for employment and higher density housing to make a significant TOD within this emerging city centre.





## DESIGN WORKSHOPS

It is significant that each of these projects utilized design workshops as a key part of the design process as workshops can address complex issues and bring a range of stakeholders together, including different government departments and the local authority to achieve excellent design responses in a short time frame. However, Design Workshops are a provocative and not universally supported design method.

Lasting from one to six days, they are collaborative processes that tackle a wide range of design issues and scales from the design of a commercial precinct such as a neighbourhood or town centre, to the urban expansion of Sydney for 250,000 people. The outputs can vary and be tailored to meet the specific needs of the client group. Similarly the participants and workshop processes can vary with focus groups and public meetings incorporated. The workshop is strongly design focused, where design outcomes are sought, not just lists of issues, principles or objectives. 'Enquiry-by-Design' is the underpinning philosophy of the design workshop.

The workshop process requires the designer to quickly come to terms with the essential issues of a project and a place, work in (and usually lead) groups, listen to varying viewpoints, direct the discussion to address the issues of the project, synthesise issues, make design responses, draw them, present them to a wider audience for review, rework them and finally present them graphically and verbally for a major final presentation at the

end of the workshop. All this is done within a short period of time with people watching for most of that time. The workshop leader keeps the team on track, ensures that all viewpoints are heard, keeps everybody happy and busy and coherently presents the work of the team at the crucial stages of the process.

Very few have the skills to actively and constructively take on the design and workshop leadership roles, with part of the reason for lack of support that architects have responded well to workshops and can be seen to taking over the role of planning and planners. Design is also seen to be taking over from the legitimate planning process. There are concerns that the workshop cannot deliver a consensus over an agreed design, as some critics have promoted. Indeed, workshops can be structured to produce well thought through design options for subsequent review, as much as a preferred outcome.

Despite criticisms by some, my experience of over twenty-five workshops have convinced me of their worth. Workshops are invaluable in achieving a better understanding of the issues, better design outcomes and stronger ownership of the design outcomes by local participants. This is particularly useful in complex urban situations, where a broad range of interests, usually in direct conflict, need to be reconciled. This also applies to regional areas, where the design team must fly or drive in to undertake the work.

The number of occasions where the workshop





processes have inspired and empowered people, where better design outcomes are achieved and perceived bottlenecks removed, are many. Many critics are those who have not experienced the workshop process and are suspicious of the power of a design process.

Drawings in workshops include plans at different scales-from broad scale to more detailed, diagrams that explain ideas and strategies, cross sections showing scale land uses and spatial relationships between elements perspectives that can explain the design and its possible built form, character and experience. They can be accompanied with statements of principles and objectives and visions.

The Rochedale project is just one of many projects in the office that used our Enquiry-by-Design

workshop process. The work exemplifies the key attributes of the process and its underlying philosophies about the design process.

Workshops are expensive as they bring all disciplines to the table. The Rochedale Workshop was conducted as two linked workshops about six weeks apart. The first was one day, the second two days, as the budget would not allow more. There were three design team leaders and a couple of very capable helpers. The first workshop focused on constraints, issues and visions with a series of meetings chaired by members of the team on the themes of environment, economics, movement, community and infrastructure. It is often difficult to obtain precise information from specialists who are not used to a design process. This workshop brings them together. The afternoon started with a group

# Rochedale

URBAN COMMUNITY

## WORKSHOP AGENDA

9.00 **INTRODUCTION**

- Purpose of Workshop
- Master Plan objectives & evaluation criteria (design, community, environment & economic)

9.15 - 10.00 **SUMMARY OF KEY ISSUES**

- Top level constraints and drivers

10.00 - 12.00 **WORKING GROUP SESSIONS IN PARALLEL**

- Clarify what we know
- List drivers and constraints in delivering Master Plan objectives

### Environment

Chair: Natasha Witting

Issues:

Green corridors

Vegetation

Noise

### Community

Chair: Bea Rogan

Issues:

Needs & facilities

Housing diversity & affordability

Open space & parkland

### Employment

Chair: Derek Kemp

Issues:

Employment

Economic development

Centres

### Infrastructure

Chair: Ken Wood

Issues:

Water

Sewer

Power

Stormwater

Telecommunications

### Movement

Chair: Lincoln Davis

Issues:

Roads, connectivity

Public Transport

Pedestrian/cycleways

12.00 - 1.00 **PLENARY REPORT BACK FROM EACH GROUP**

1.00 - 1.45 **LUNCH** (project team to synthesise over lunch)

1.45 - 3.30 **VISIONING FOR ROCHEDALE**

- Core themes - logical links
- Fundamental principles - density and land use (living and working)
- Scenarios for design responses
- Purpose of Design Workshop

3.30 - 5.00 **CLOSE WORKSHOP & CONVENE TEAM MEETING**

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Rochedale URBAN COMMUNITY		PROGRAM	
	<b>Tuesday 5th May</b> <i>Workshop Day 1</i>	<b>DAY 1 Wednesday 14th April</b> <i>Workshop Day 2</i>	<b>DAY 2 Thursday 15th April</b> <i>Design Review and Finalisation</i>
9am		<b>OVERVIEW:WORK TO DATE</b> - Consolidated Constraints, Response Plan, The Design Brief, Questions and Comments Statements by Design Team Leaders Visions approaches by Walker, McKinnon & Richards.	<b>TEAM MEETING REVIEW</b> - Confirm design directions, 15,000 Design studies, Main centres, First stage, Employment Precinct, Suboptimal Building Types BCC Core Team (optional)
10am		<b>MORNING TEA</b>	<b>MORNING TEA</b>
10.30am		<b>FIRST DESIGN SESSION</b> Gateways, centres, corridors, connectivity. Stakeholders stay Key decision makers stay	Continue designing
12.30pm		<b>LUNCH</b>	<b>(1:00PM) WORKING LUNCH</b>
2pm	<b>SET UP STUDIO</b> Seating for 25-30, 3 design tables, 1 table for reference material	<b>DEICKE RICHARDS CONSORTIUM DESIGN SESSION</b> First cut structure plans.	Finalise concepts, Refine key development principles, Clean studio
3.30pm			<b>AFTERNOON TEA &amp; PRESENTATIONS</b> - Presentation by Design Team Leaders, Three options, Site specific studies, Core design principles, Feedback and commentary
4.30pm		<b>DESKTOP REVIEW</b> - Issues, Strategies, Areas of Agreement, Key Tensions BCC Core Team	
5.30pm		<b>DINNER</b>	
7pm		Evening Design Session as needed	
DEICKE RICHARDS CONSORTIUM			





feedback session and concluded with a confirmation of issues and a synthesis and visioning process.

The second workshop was more design focused. The first morning was a series of presentations, reconfirming issues and constraints with broader representation from Council and Government to agree the 'rules' that would inform the design response, in effect the design brief.

Since the first workshop, the design team had prepared a CAD site analysis plan, showing environmental areas, drainage lines, ridges and hilltops, community facilities and vegetation protection, amongst others. A synthesis plan of issues had been done by hand at the same scale.

The consultant teams concern for project constraints was interestingly not shared by parts of the client group. We don't see things in this way. Unfettered creativity, sometimes advanced as the best design method by architects, can be undermined by real

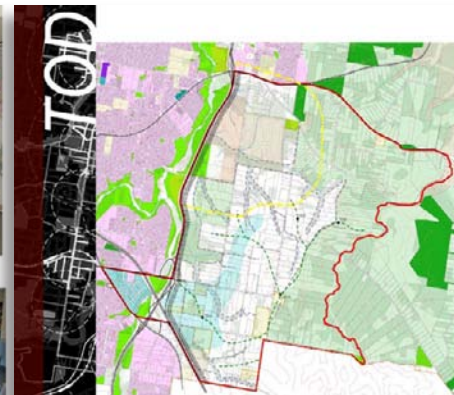
and reasonable constraints from a specialist whether it be traffic, environment or other. For us, creativity is best informed by a thorough understanding of the issues, where win/win outcomes are genuinely sought.

A small group session followed where 'fast and furious' concepts were development in six teams. A short pin-up completed the session and the broader group left the core team to continue working. The afternoon on Day 1 was attended by the consultant and client team only and consisted of group discussions, then work in 3 groups developing another version of the structure plan at 1:10,000.

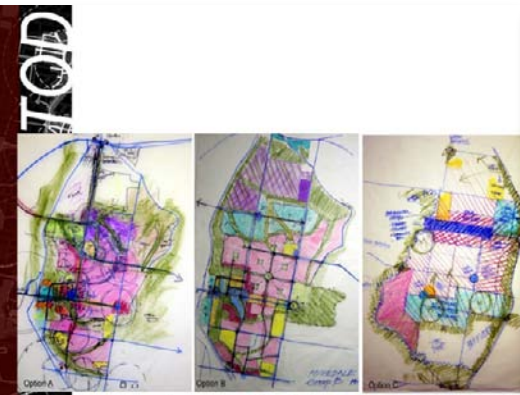
A pin-up / critique / discussion completed the day's work and a plan for day two made. Each proposal had good ideas; points of similarity can be interpreted as formative ideas. Points of difference reveal the potentially contentious issues that may require more negotiation, research or consultation.



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The plans showed:

1. Centres types, locations and role.
2. Community facilities and regional parks locations.
3. Street connectivity both local and regional.

On day two, the scale of the structure plans changed to 1:5,000 as streets can be outlined at this scale and more issues can be investigated. Because the environmental issues were significant, a small splinter group went off line and developed an environmental strategy for the site. Ideas about the interfaces and scale of built form adjacent green corridors and along arterial roads were also considered.

The workshop was not the only phase of the design, but an instrumental part of larger process. It helped the team understand the key issues of the site and identified important design ideas and contentious issues that required further consideration. And it delivered the basis of the structure plan that was subsequently developed.

## CONCLUSIONS

2006 is a good time to be an urban designer. Through the Regional Plan, the South East Queensland Region has a significant agenda to create more sustainable urban settlement outcomes in the growth that is anticipated. The commitment of the Government to new public transport infrastructure has created a range of projects where land-use and public transport integration needs to be taken very seriously. Theories need to be put into practice, TOD is the new 'black' and we must ensure that Transit Oriented is applied in all development at all scales. This is our challenge, and it is good to be a part of it.