TAMALA PARK
REGIONAL COUNCIL

Special Meeting of Council

MINUTES

Thursday 13 March 2008
City of Joondalup, 6pm

TAMALA PARK
REGIONAL COUNCIL
(TPRC)
COMPRISES THE
FOLLOWING
COUNCILS:

Town of Cambridge
City of Joondalup
City of Perth
City of Stirling
Town of Victoria Park
Town of Vincent
City of Wanneroo

MEMBERSHIP

OWNER COUNCIL	MEMBER	ALTERNATE MEMBER
Town of Cambridge	Mayor Simon Withers	
City of Joondalup	Cr Albert Jacob Mayor Troy Pickard	
City of Perth	Cr Eleni Evangel	
City of Stirling	Cr Paul Collins Cr John Italiano Cr David Michael Cr Bill Stewart	Cr Kathryn Thomas Cr Terry Tyzack
Town of Victoria Park	Mayor Trevor Vaughan	
Town of Vincent	Mayor Nick Catania	Cr Steed Farrell
City of Wanneroo	Cr Tracey Roberts Cr Bob Smithson	Cr Alan Blencowe Cr Frank Cvitan

NB: Although some Councils have nominated alternate members, it is a precursor to any alternate member acting that a Council carries a specific resolution for each occasion that the alternate member is to act, referencing Section 51 of the Interpretation Act. The current Local Government Act does not provide for the appointment of deputy or alternate members of Regional Councils. The DLGRD is preparing an amendment to rectify this situation.

TABLE OF CONTENTS

MEMBERSHIP 2
PRESENT 4
PRELIMINARIES 4
1. OFFICIAL OPENING 4
DISCLOSURE OF INTERESTS 4
2. PUBLIC STATEMENT/QUESTION TIME 5
3. APOLOGIES AND LEAVE OF ABSENCE 5
4. PETITIONS 5
5. CONFIRMATION OF MINUTES 5
6. ANNOUNCEMENTS BY CHAIRMAN (WITHOUT DISCUSSION) 5
7. MATTERS FOR WHICH MEETING MAY BE CLOSED 5
8. REPORTS OF COMMITTEES 5
9. PURPOSE OF THE MEETING 5
10. ELECTED MEMBERS MOTIONS OF WHICH NOTICE HAS BEEN GIVEN .. 5
11. QUESTIONS BY ELECTED MEMBERS OF WHICH DUE NOTICE HAS BEEN GIVEN 5
12. URGENT BUSINESS APPROVED BY THE CHAIRMAN 6
13. MATTERS BEHIND CLOSED DOORS 6
14. GENERAL BUSINESS 6
15. FORMAL CLOSURE OF MEETING 6

PRESENT

Chairman	Cr Troy Pickard
Deputy Chairman	Cr Tracey Roberts
Councillors	Cr Paul Collins Cr John Italiano Cr Albert Jacob Cr Bob Smithson Cr Bill Stewart Cr Trevor Vaughan Cr Simon Withers
Alternate Members	Nil
Staff	Rod Constantine (Chief Executive Officer)
Apologies Councillors	Cr Nick Catania Cr David Michael
Leave of Absence	Cr Eleni Evangel
Absent	Nil
Consultants	Nil
Apologies Councils' Advisors	Lewis Bond (City of Perth) Frank Edwards (City of Perth) John Giorgi (Town of Vincent) Charles Johnson (City of Wanneroo)
Councils' Advisors In Attendance	John Bonker (Town of Victoria Park) Garry Hunt (City of Joondalup) Mike Tidy (City of Joondalup
Members of the Public	Nil
Press	Nil

PRELIMINARIES

Chairman Cr Troy Pickard said an opening prayer before the commencement of the meeting.

1. OFFICIAL OPENING

The meeting was declared open at 6:10pm.

DISCLOSURE OF INTERESTS

Nil

2. PUBLIC STATEMENT/QUESTION TIME

Nil

3. APOLOGIES AND LEAVE OF ABSENCE

Apologies were received from the following councillors:

- Cr Nick Catania
- Cr David Michael

Cr E Evangel has a leave of absence for the period 25 February 2008 to 14 March 2008 inclusive.

4. PETITIONS

Nil

5. CONFIRMATION OF MINUTES

Not applicable

6. ANNOUNCEMENTS BY CHAIRMAN (WITHOUT DISCUSSION)

Nil

7. MATTERS FOR WHICH MEETING MAY BE CLOSED

Nil

8. REPORTS OF COMMITTEES

Not applicable.

9. PURPOSE OF THE MEETING

A PowerPoint presentation outlining the matters to be considered in the TPD structure plan was received and discussed.

Copies of PowerPoint slides used in the presentation were distributed to elected members and are attached as an inclusion for Minutes.

It was resolved that the presentation be RECEIVED by absolute majority.

10. ELECTED MEMBERS MOTIONS OF WHICH NOTICE HAS BEEN GIVEN

Nil

11. QUESTIONS BY ELECTED MEMBERS OF WHICH DUE NOTICE HAS BEEN GIVEN

Nil

12. URGENT BUSINESS APPROVED BY THE CHAIRMAN

Nil

13. MATTERS BEHIND CLOSED DOORS

Nil

14. GENERAL BUSINESS

Nil

15. FORMAL CLOSURE OF MEETING

The Chairman declared the meeting closed at 8.15pm.

These minutes were confirmed at a meeting on ……..

SIGNED this ……. day of ……..…. 2008

as a true record of proceedings.

_____

CHAIRMAN

Tamala Park Regional Council

Presentation to Special Meeting of Council
13 March 2008

Structure Plan (original)

Structure Plan (proposed)

Key Strategic Goals

- Lifestyle and housing choice
- Effective use of land and infrastructure
- Long term health of the environment
- Identity, equity and inclusiveness
- Long term economic health
- People and government

(City of Wanneroo Smart Growth Criteria)

Structure Plan Flowchart

- Environment
- Regional infrastructure
  - Roads
  - Schools
  - Transport
- Environment
- Economic
  - Feasibility
  - Employment
- Community
- Specific MRS and local government requirements
- Planning
  - Neighbourhood Planning
  - Land uses
  - Integration of uses to district
  - Community infrastructure

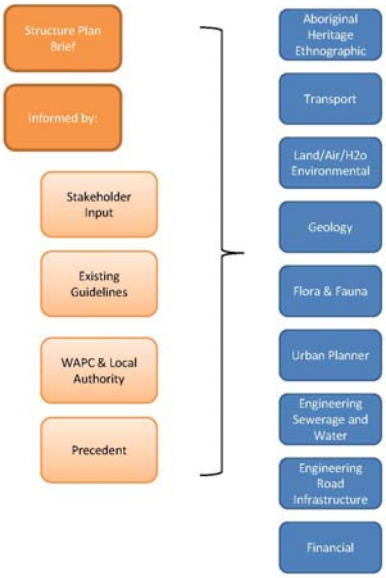
- Amendment
  - Roads
  - Deferred Urban to Urban zoning

- Area structure planning in detail
- Infrastructure
  - Water
  - Drainage
  - Public transport
- Economic
  - Cost contribution
  - Local centres
- Planning
  - Density
  - Lot yields
  - Street layouts
  - Built form guidelines
  - POS

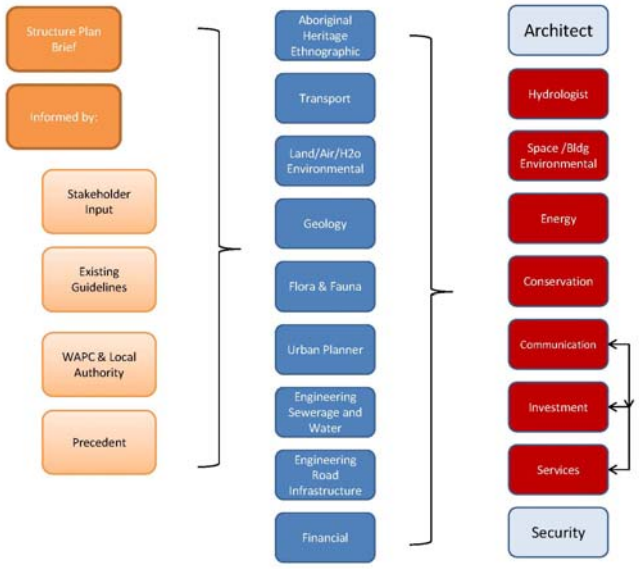
- Rezoning
- Guidelines
- Contributions

- Subdivision and development in accordance with district and local structure plans
- Accentuating
  - Planning philosophy
  - Natural attributes
- Developing community

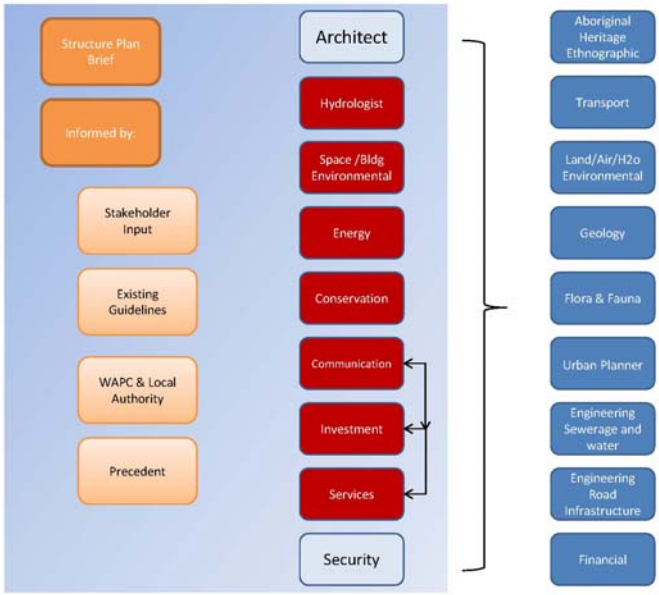
Structure Plan Flowchart



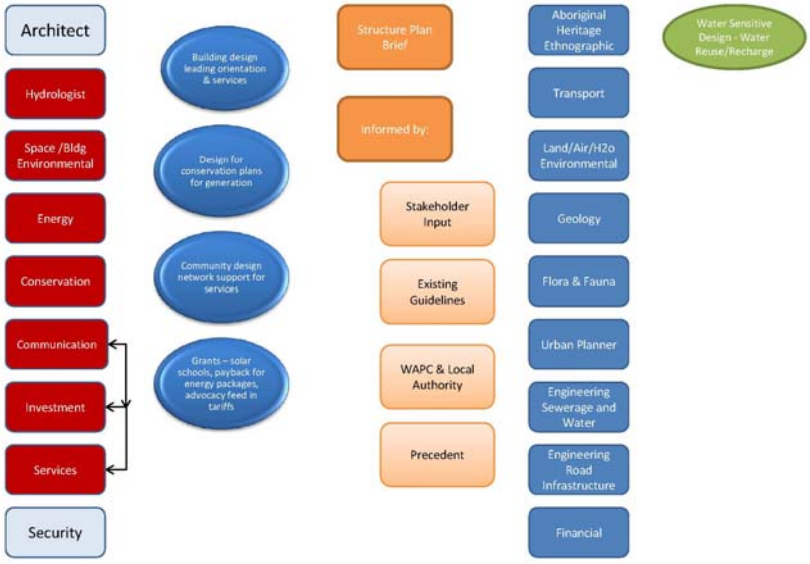
Structure Plan Flowchart



Structure Plan Flowchart



Structure Plan Flowchart



Communication

Communication/Optical Fibre Network

1. Broadband at 150mbps can be provided to TPD
2. Long term – Government plans broadband at 50mbps
3. TPRC can provide and lease 2 conduits to provide services and revenue
4. The network to be optical fibre into every meterbox and through buildings
5. Ownership of conduits remains with TPRC
6. TPRC reserves space in conduits for TPRC and community networks
7. Bottom line
   - Better and bigger range of services
   - No additional net infrastructure cost
   - Ongoing annual revenue

Communication/Optical Fibre Network

1. Possible uses – existing technology
   - Entertainment services
   - Local intranet – TV internet
   - IP telephony
   - Monitoring panels – roof solar grid – water gathering & reuse
   - Estate reticulation to homes, verges, parks, schools
   - Security cameras – home and estate
   - Internet service delivery
     - Medical services
     - Household maintenance
     - Purchases from local retailers
   - Estate services
     - Information and events
     - Hazard notification
     - Immediate information - train/bus/schools
     - Car pooling
     - Estate information – performance/power generation/water recycling
2. Possible uses – development technology
   - Automation - electronic signage
   - Automation - LED street lights
   - Automation – Water harvesting/treatment

Communication/Optical Fibre Network

Future advantages

- Massive growth capacity
- New services without additional infrastructure
- New providers – capacity provided in dual conduits
- Reduction in public place disturbance to provide new infrastructure
- Remote capacity to adjust services' behaviour (elimination of solid state on site appliances)
- Future commercial opportunities e.g. road transponding devices supporting GPS, transport delivery, tracking services
- Automation local transport signals
- Automation tramway services

Power

Power

1. Western Power substation requirements
2. Western Power physical land and physical infrastructure (including transmission lines)
3. Power generation within Tamala Park
4. Power utilisation within Tamala Park

Substation 1
Connect Hester Road & Clarkson Substations

Boost inadequate capacity new developments

- Burns Beach
- Tamala Park
- Mindarie Keys
- Neerabup Industrial Area (via Clarkson)

Impacts

- Land area requirement 1.2 hectare
- 132 kv overhead transmission lines
- Road medians Connolly Drive, Marmion Avenue
- Location (2km radius) - aesthetics

Substation 2

- Substation 2 - MRC feed - in power
- Land area requirement 1.0 hectare
- Connection grid Marmion Avenue
- Owners cost
- Land ownership/contract (power generation) issues
- Future use of Tamala Park closed landfill

Power Self Sufficiency – Tamala Park

- Solar Roof Top Power Grid - 2.5 hectares
- Solar Concentrator Array - MRC landfill
- Wind Turbines - (iconic statement & high generation capacity)
- Gas Plant - methane from MRC landfill
- BioDiesel - Potential Plant (plastics) MRC

Power Self Sufficiency – Tamala Park

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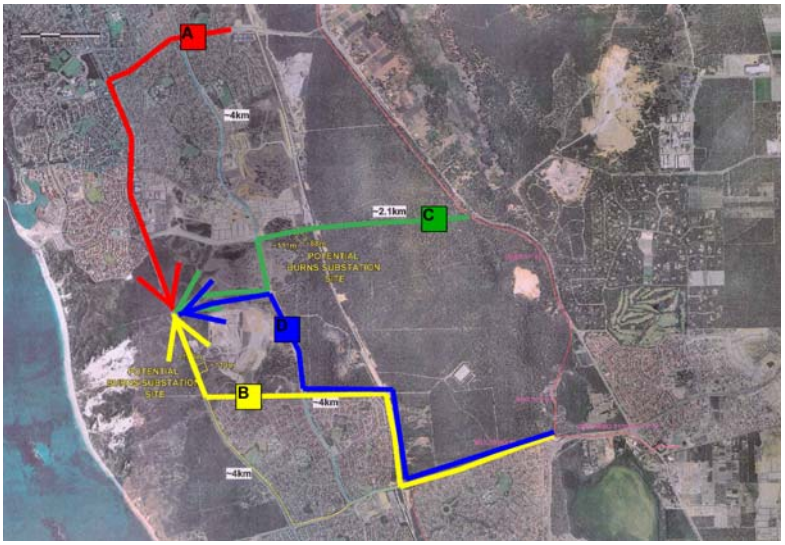
Power - Actions Taken - WP

- Letters/meetings WP 2006 - current
- Positions at EBD Workshop
- Undergrounding lines proposed + $1.5m KL
- Other line routes substation locations proposed
- TPRC/MRC generating capacity explained
- Conduits proposed - TPRC cost (Connolly Drive)
- WP now installing lines - Burns Beach Rd
- WP & MRD exploring site Neerabup/Freeway (Valuations)

Western Power Proposed Substation



TPRC Supply Potential - Actions

- Roof top grid & solar array
- Gas generating contract from MRC landfill
- Estimates of utilisation/production prepared
- Linkage to optical fibre network resolved
- Cost assessment/financial benefits explored
- Feed in tariffs
- Direct use of DC power generated (public lighting tramway)

Energy Generation

Solar Rooftop Grid	3.00 Mw
Solar concentrator array	3.5
Wind Turbines	2.0
Landfill Gas Plant	6.0
Biodiesel Plant ??	
Total	14.5 mw
TPRC "Normal" Use	3.00 mw
Surplus Revenue Generating	11.5 mw Value $m 3.06pa

Financing Payback

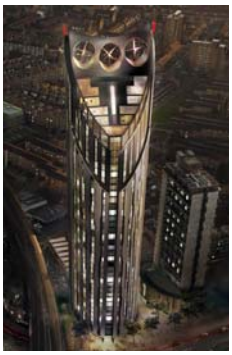
	Solar Roof Grid	Solar Array	Wind Power	MRC Gas Plant	Biodiesel Plant
Government Subsidy Solar Cities Grant	76% 8%	30%	17%		
Land premium	16%	3%	3%		
Interest Revenue	2%	1%	1%		
Building Cost Saving	2%				
Meter Reading Rebate	1%				
External Finance		66%	79%	100%	100%
Feed in Tariff	(100%) 10 Yrs	(100%) 10 Yrs	100% 10yrs	100% (12 yrs)	100% 5 yrs

New Energy Uses - TPD

- Tramway
- LED lights, signs streets and public places
- Water Treatment Plant
- BioDiesel Plant
- Estate Reticulation

Wind Power

Quiet revolution wind turbines



Apartment tower to feature integrated wind turbines

Wind turbines in the Galapagos

'Aquarius' tower to integrate wind turbines

Solar & wind powered streetlights

Micro wind turbines

LED Lighting

LED Lights

- Commercial buildings & homes
- Roadways
- Landscaping
- Walkways
- Signage

- Schools & public buildings/places

Why LED's?

- Opens opportunities for a Greenfield development
- Can use TPRC generated power
- Use direct current – no alternating power conversion
- Use about 10% power for equivalent light
- Light leakage problem resolved
- Light can be targeted to discrete uses, (security, safety, illumination etc)
- Light system can be programmed
- Different illumination level or colour spectrum at different hours of night or purpose
- Can be programmed to follow use

LED Lighting Facilitates

- Tram
- Greenway lighting
- Street signs paradigm change
- One sign multiple purposes e.g. (parking signs 8am-5pm Mon- Sat not needed outside these hours)
- Additional street name, direction, message aesthetic, bus stop and timetable
- Street signage LED in lamp pole

LED Benefits

- Use of TPRC generated power – no cost
- Savings over equivalent current products
- Net additional green power into Western Power grid

Issues with LED Lights

- Heat sinks
- Colours
- Lumens per watt
- Regulatory authorities

Current Uses

- Honda and other cars
- All electric appliances monitor or pilot light
- In car dashboards
- Lights in water
- Large screens at sporting events
- Signage
- White/blue car headlights (Audi, Toyota, Lexus 2008)
- Now next generation of television (Sony)
- Street and public place lighting – Canada (Xmas 2007), China, Europe, United States

In Australia

- Most recent studies say LED for street lighting – yet to be accepted in trials
- Australian greenhouse office study currently promoting move to but does recognise future LED possibilities

Audi Pioneers First All-LED Headlight

Audi have developed the first headlight cluster illuminated solely by LED lights.

The use of LED's in car lights is nothing new, however Audi have been the first to utilise the technology as more than an aesthetic feature in turn signals as well as for the low and main beam.

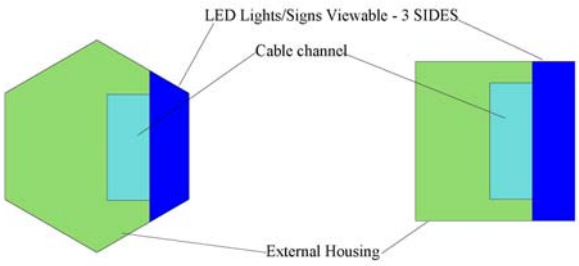
The outstanding benefits of LED technology include its low energy consumption, a daylight colour for enhanced contrast and more pleasant visual perception, the non-wearing design, lower voltage requirements and compact dimensions.

LED Illuminated Street Signs

Solar Trees

LED Road/Parking/Direction Signs

TYPICAL CROSS SECTIONS FOR LIGHT POLES INCORPORATING LED SIGNAGE AT DIFFERENT LEVELS



Bottom Line

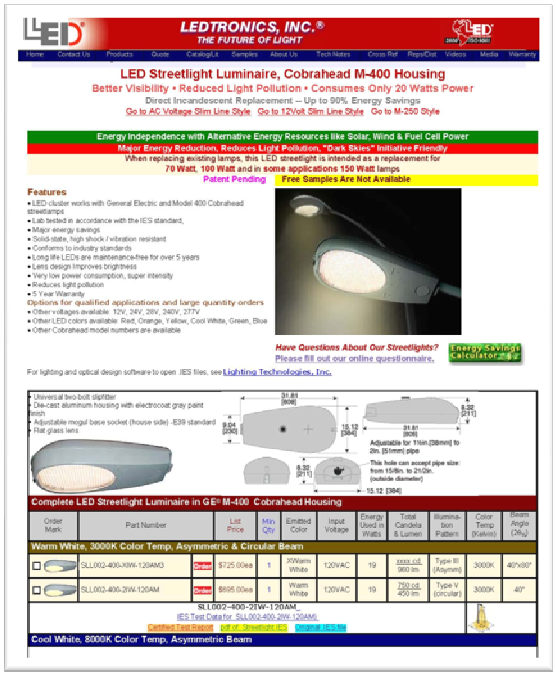
- Objectives achieved
- Security
- Economy
- Environment
- Long term cost savings – residents
- Long term cost savings – local authority
- Aesthetic quality of landscape/streetscape
- Supports a variety of additional environmental economic and community objectives

Cost Issues

- Nil additional
- Long term maintenance and infrastructure saving
- Enhanced possibilities of no resident power bill, two monthly credit for households

TPRC Project Issues

- Timing – no technical problem for street lights and signs
- Manufacture for Australian (TPRC requirements) to be negotiated
- Grant issues to be resolved with new Federal Govt programs
- Regulatory acceptance required
- Test sites within participant Local Governments required



LEDTRONICS, INC.®
THE FUTURE OF LIGHT

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LED Streetlight Luminaire, Cobrahead M-400 Housing
Better Visibility • Reduced Light Pollution • Consumes Only 20 Watts Power
Direct Incandescent Replacement – Up to 90% Energy Savings
Go to AC Voltage Slim Line Style Go to 12Volt Slim Line Style Go to M-250 Style

Energy Independence with Alternative Energy Resources like Solar, Wind & Fuel Cell Power
Major Energy Reduction, Reduces Light Pollution, "Dark Skies" Initiative Friendly
When replacing existing lamps, this LED streetlight is intended as a replacement for
70 Watt, 100 Watt and in some applications 150 Watt lamps
Patent Pending Free Samples Are Not Available

Features
- LED cluster works with General Electric and Model 400 Cobrahead streetlamps
- Lab tested in accordance with the IES standard.
- Major energy savings
- Solid-state, high shock / vibration resistant
- Conforms to industry standards
- Long life LEDs are maintenance-free for over 5 years
- Lens design improves brightness
- Very low power consumption, super intensity
- Reduces light pollution
- 5 Year Warranty

Options for qualified applications and large quantity orders
- Other voltages available: 12V, 24V, 28V, 240V, 277V
- Other LED colors available: Red, Orange, Yellow, Cool White, Green, Blue
- Other Cobrahead model numbers are available

Have Questions About Our Streetlights?
Please fill out our online questionnaire.
Energy Savings Calculator

For lighting and optical design software to open .IES files, see Lightning Technologies, Inc.

- Universal two-bolt slipfitter
- Die-cast aluminum housing with electrocoat gray paint finish
- Adjustable mogul base socket (house side) - E39 standard
- Flat glass lens

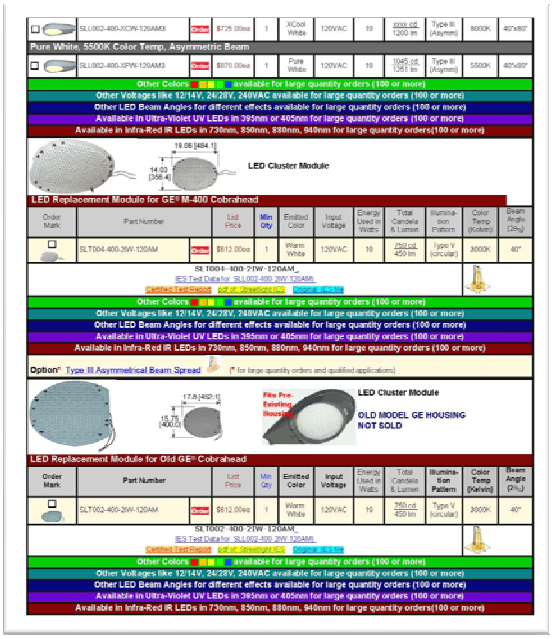
Adjustable for 1½in.(38mm) to 2in. (51mm) pipe.
This hole can accept pipe size: from 1⅝in. to 2½in. (outside diameter)

Complete LED Streetlight Luminaire in GE® M-400 Cobrahead Housing

Order Mark	Part Number		List Price	Min Qty	Emitted Color	Input Voltage	Energy Used in Watts	Total Candela & Lumen	Illumination Pattern	Color Temp (Kelvin)	Beam Angle (2θ½)
Warm White, 3000K Color Temp, Asymmetric & Circular Beam											
	SLL002-400-XIW-120AM3	Order	$725.00ea	1	XWarm White	120VAC	19	xxxx cd 960 lm.	Type III (Asymm)	3000K	40°x90°
	SLL002-400-3IW-120AM	Order	$695.00ea	1	Warm White	120VAC	19	750 cd 450 lm.	Type V (circular)	3000K	40°

SLL002-400-2IW-120AM
IES Test Data for SLL002-400-2IW-120AM
Certified Test Report Pdf of StreetLight IES Original IES file

Cool White, 8000K Color Temp, Asymmetric Beam



	SLL002-400-XCW-120AM3	Order	$725.00ea	1	XCool White	120VAC	19	1000 cd. 1200 lm	Type III (Asymm)	8000K	40°x80°
Pure White, 5500K Color Temp, Asymmetric Beam											
	SLL002-400-XPW-120AM3	Order	$870.00ea	1	Pure White	120VAC	19	1045 cd. 1251 lm	Type III (Asymm)	5500K	40°x80°

Other Colors available for large quantity orders (100 or more)
Other Voltages like 12/14V, 24/28V, 240VAC available for large quantity orders (100 or more)
Other LED Beam Angles for different effects available for large quantity orders (100 or more)
Available in Ultra-Violet UV LEDs in 395nm or 405nm for large quantity orders (100 or more)
Available in Infra-Red IR LEDs in 730nm, 850nm, 880nm, 940nm for large quantity orders(100 or more)

19.06 [484.1]
14.93 [379.4]
LED Cluster Module

LED Replacement Module for GE® M-400 Cobrahead

Order Mark	Part Number		List Price	Min Qty	Emitted Color	Input Voltage	Energy Used in Watts	Total Candela & Lumen	Illumination Pattern	Color Temp (Kelvin)	Beam Angle (2θ½)
	SLT004-400-2W-120AM	Order	$612.00ea	1	Warm White	120VAC	19	750 cd. 450 lm	Type V (circular)	3000K	40°

SLT004-400-21W-120AM_
IES Test Data for SLL002-400-2W-120AM_
Certified Test Report | Out of Stock Item | Digital TCS Site
Other Colors available for large quantity orders (100 or more)
Other Voltages like 12/14V, 24/28V, 240VAC available for large quantity orders (100 or more)
Other LED Beam Angles for different effects available for large quantity orders (100 or more)
Available in Ultra-Violet UV LEDs in 395nm or 405nm for large quantity orders (100 or more)
Available in Infra-Red IR LEDs in 730nm, 850nm, 880nm, 940nm for large quantity orders (100 or more)

Option* Type III Asymmetrical Beam Spread (* for large quantity orders and qualified applications)

17.8 [452.1]
15.75 [400.0]
Fits Pre-Existing Housing
LED Cluster Module
OLD MODEL GE HOUSING NOT SOLD

LED Replacement Module for Old GE® Cobrahead

Order Mark	Part Number		List Price	Min Qty	Emitted Color	Input Voltage	Energy Used in Watts	Total Candela & Lumen	Illumination Pattern	Color Temp (Kelvin)	Beam Angle (2θ½)
	SLT002-400-2W-120AM	Order	$612.00ea	1	Warm White	120VAC	19	750 cd. 450 lm	Type V (circular)	3000K	40°

SLT002-400-21W-120AM_
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Water Management

Water Regime TPD Area
Projected Water Use – Balance
Water Harvesting Planning
Actions Taken
Projected Financing

Water Regime

- Headworks
- Sumps in Neerabup Road
- Water Corporation Extraction Bores
- Water Corporation Treatment plant
- MRC Extraction Bore
- Leachate from Landfill
- Underground Hydrology

CSIRO Monitoring Bores – TPD Locality

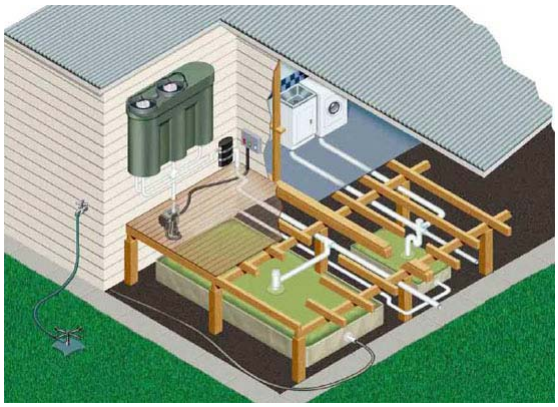
Projected Water Use

Water Use Assumptions						
Assuming 150 KLS per person per Annum - 7000 persons						
	Outdoors	Toilet	Bathroom	Laundry	Kitchen	Total
	47%	12%	18%	14%	9%	**100%**
Per person kls	71	18	27	21	14	**150**
6000 persons/180kls/7000/150	493,500	126,000	189,000	147,000	94,500	**1,050,000**
	Reused/Borewater	619,500		Potable	430,500	**1,050,000**
School use	54,000					
Active reserves (11 hectares)	126,000					
Greenway/passive reserve	63,000					243,000
		243,000				
		862,500	-	-	**430,500**	**1,293,000**
	80%	**344,400**				
Household Rainwater Tanks		18,000				
Public Place Harvesting		120,000				
		(482,400)				
KLS		**380,100**			**430,500**	**830,600**
ML		**380.10**				
GL		**0.38**				
Evaluating						
NB: Rainwater tank overflow to second pipe for central collection						
Community bore						
Blackwater retrieval/treatment						

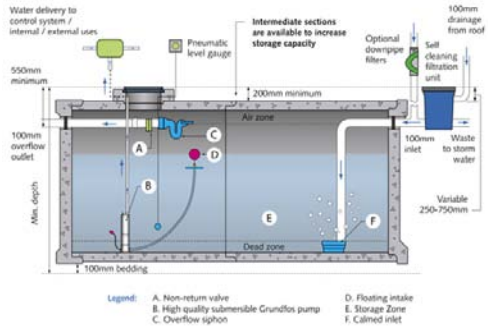
Water Management Planning

- On lot greywater systems
- Reduced use – appliances and processes
- Estate options (communal bores)
- Landscape design (public and private)
- Water Harvesting Treatment and Reuse
- Conserving site hydrology
- New Treatment technology

Greywater Systems



Rain Vaults/Tanks



Rain vault installation

Aquifer Recharge

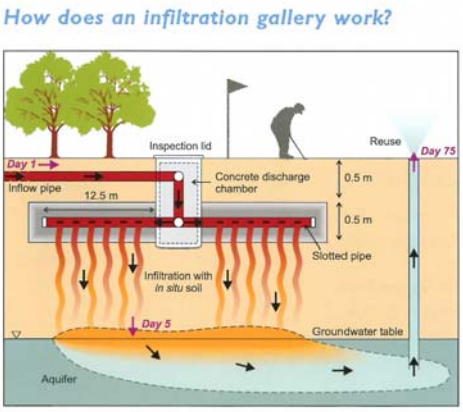


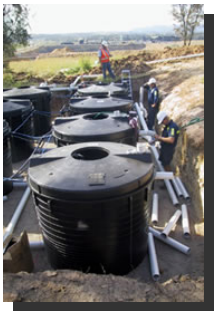
Figure 1: Cross-section of an infiltration gallery, beneath a golf course.

Managed aquifer recharge is a method of adding a water source such as recycled water to underground aquifers under controlled conditions. The water can be withdrawn at a later date, or used as a barrier to prevent saltwater or other contaminants from entering the aquifer.

Water can be added to the aquifer by a number of methods including infiltration via basins or galleries or by the use of injection wells.

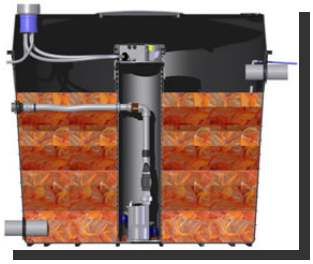
This project uses infiltration galleries to recharge the water.

Biolytix

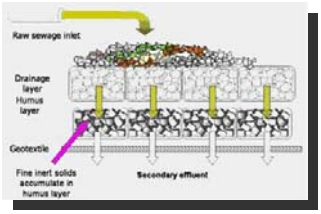


Ashton mine sewerage treatment plant, Hunter Valley, NSW

Macleay Island Biowater Project ,QLD



The global award winning Biolytix Filter



Biolytix NPV/GHD Engineers

	CGS	MGS	CED	Biowater
Residential site capital	172.5	172.5	202.0	703.0
Reticulation capital	1,147.5	941.7	842.4	375.0
Sewerage treatment capital	602.8	553.0	477.6	0.0
Sewerage infrastructure capital	**1,922.8**	**1,667.2**	**1,522.0**	**1,078.0**
Treated water storage & irrigation	545.0	467.5	345.0	360.0
Total capital	2,467.8	2,134.7	1,867.0	1,438.0
NPV operating over 20 years	461.9	514.1	522.9	596.7
TOTAL NPV	**2,929.7**	**2,648.8**	**2,389.9**	**2,034.6**

CSIRO Study

- A maximum demand of 90,000kl of potable water per person per annum;
- Optimal recycling of water within the urban development having regard for energy requirements and costs for water treatment;
- Aquifer recharge of stormwater and water harvested from households for reuse in greenways, active sporting fields and outdoor use generally within the urban development;
- Identification of ideal locations for aquifer recharge;
- Determination of the suitability of possible greenways within the Tamala Park development for water harvesting, water storage and infrastructure piping to facilitate recycling of harvested water to households;
- Household systems suitable for water recycling;
- Potential re-contouring of the urban development land to assist the outcomes listed in above;
- Preferred locations for a primary and middle school (13 hectares) and active recreation grounds comprising 10 hectares;
- Preferred location for community bores necessary to supplement harvested and recycled water to achieve the target of a maximum 90,000kl of potable water per person; and
- Retention of all waste water within the TPRC development i.e. no piped wastewater (except, possibly, sewerage) offsite.

Water Options

- Maintenance
- Costs
- Financing

Schools

Schools

- View location
- Ratio: 1 high 5 primary - primary 750 household
- High school 2,500 households

Schools

- School site requirement
- Primary - 4 Hectares
- Primary & Middle - 13 hectares
- Primary and High School 19 hectares - (2,500)
- 19 hectares is (10 % of Urban Development site)

Implications of School

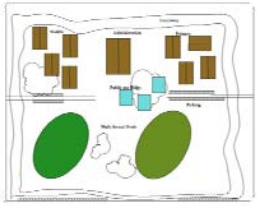
- Location
- Transit oriented design
- Traffic movements & parking (inc multi use)
- Recreation
- Public Buildings planning (gymnasiums/halls)
- Water Harvesting – Water Bores – Reticulation
- Viability of East/West Transit system

DET Negotiations Summary

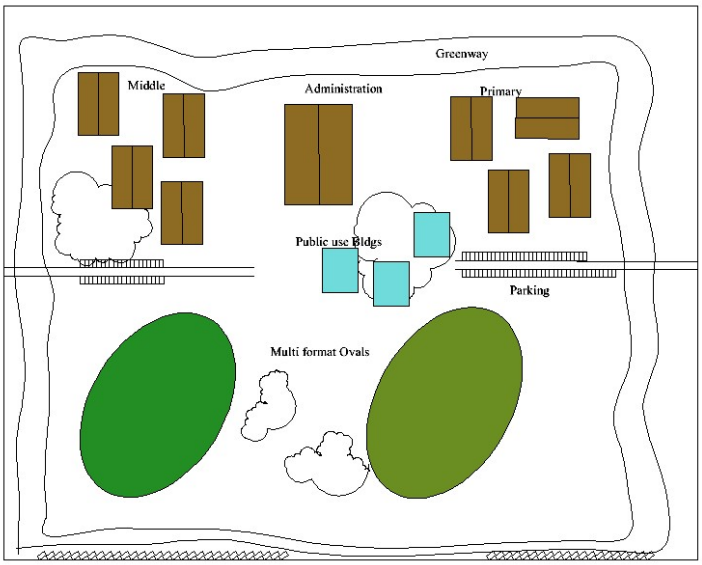
- Liaison with DET
- Planning committee – review High school requirement
- Prepared to work with TPRC on building design, water, power, solar
- Shared use of buildings & spaces
- Incorporation of greenway and tramway in school precinct design

Schools/Reserves Conceptual Issues for Design

- Concept Plan
- Locate for convenience water harvesting/bore
- Tramway stops at school gates
- Walkways/cycleway greenway locations
- Shared parking
- Buildings location
- Current position



Schools Concept



Road Access Barriers

Access Barriers

Arterial Roads

- Marmion Avenue
- Connolly Drive
- Neerabup Road
- Mitchell Freeway

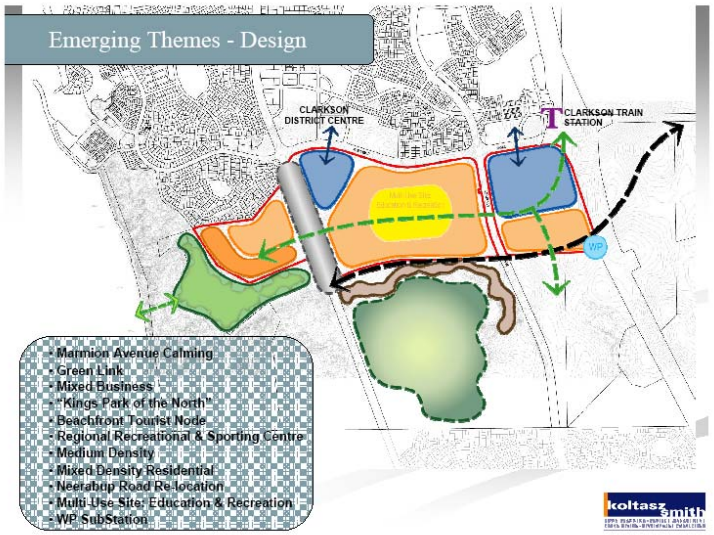
- Vehicle Mobility

- Local movement barriers
- East/west
- To retail & commercial
- To bus & rail

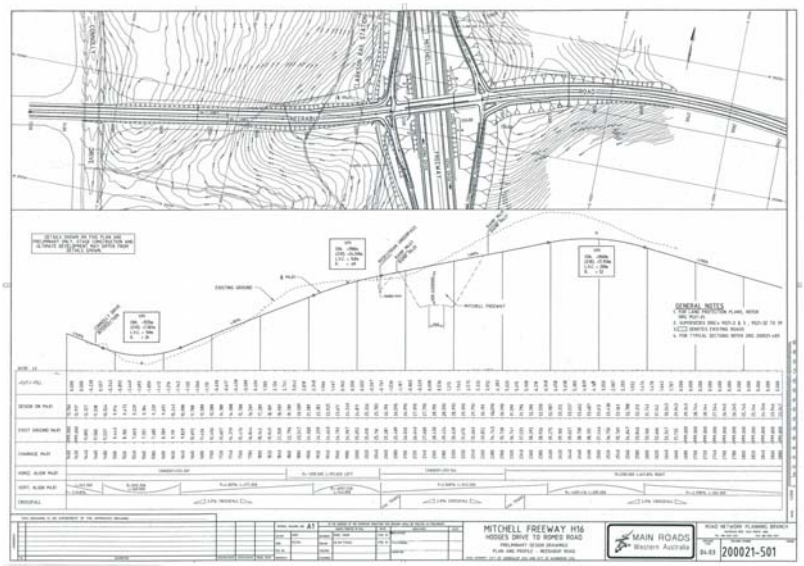
- Heritage site

Clarkson Commercial & Business Centre

Conceptual Design

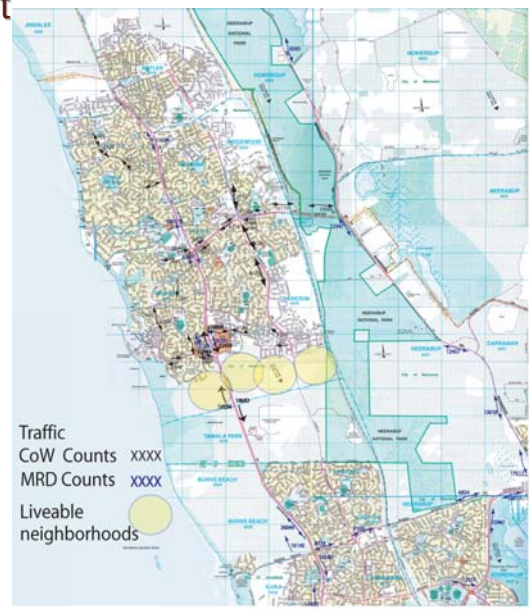


Mitchell Freeway Neerabup Interchange



View larger image

Traffic Data Count



Traffic Data Count Link

TPD Area Distance Measurements

TPD Possible Greenway Network

Street Cars

PLANNING
FOR PRIVATE INVESTMENT AND PEDESTRIANS
3

Traffic calming in the River District

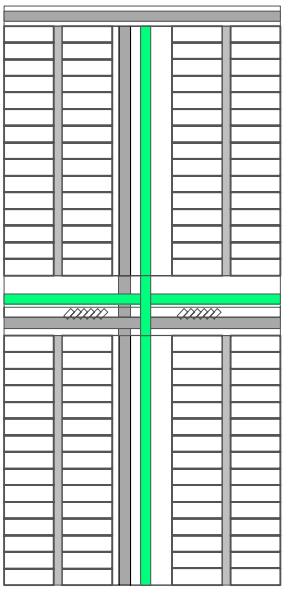
Urban Bike Sharing

Bike sharing is an optimal method of transportation.

American cities and universities, eager for greener solutions to urban congestion, are rushing to set up bicycle-sharing programs similar to those launched in Europe in recent years.

Washington DC will likely be the first in the nation to offer two-wheeled transport at various locations for a nominal fee, under a deal with advertising giant Clear Channel Outdoor.

Greenway Concept Detail



TPD Possible Greenway Network

Base Greenway Data

Base Greenway Data	Linear	Width	space
		Metres	Hectares
East West Greenwy	2742		
Nth Sth (2) greenways 1605	1605		
Total Greenway	4347	25	10.868
less Multi Use Sch & Oval	-1200	25	-3.000
	3147		7.868
less normal Road Verge	3147	4	1.259
Net Greenway Space			6.609
2 Oval Active Space Req'd			**10.735**
Total Open Space (Exc School)			**17.344**

POS Required at base 10%	
Gross Subdv area	180.844
Normal POS @ 10%	18.084
POS Concession	-1.623
Net POS Requirement	**16.461**

Aptera

The Aptera is a futuristic car that has generated a lot of buzz lately (and with good reason), the Aperta is a very, very efficient vehicle. The car's head-turning design has a purpose: the shape is highly aerodynamic (much like a jet). It is available for pre-order, and priced at about $27,000. There will be two models of the Aptera: an all-electric version that goes 120 miles on a charge (for 2008), and a gasoline version that will get 300 mpg (for 2009). The car is also said to be very safe.

Aptera founder and CEO Steve Fambro says sticking your hand out the window of an average car driving 55 mph creates more drag than the Aptera's entire body. Recently, Popular Mechanics, took the Aptera for a test drive. Here's their enthusiastic reaction:

Turn the dial to the "D" position, and the Aptera accelerates like many other pure EVs, with a constant rush of torque. The powertrain pulls strongly up to 50 mph or so (the fastest the streets on our route would allow). Interestingly, when you floor the accelerator, there's a moment when the rearend jacks up slightly as the torque is applied. It's a slight feeling, as it is on some shaft-drive motorcycles — and it's kind of fun. It makes the acceleration feel stronger than it is.

Constraints to use of the Land

- Flora and Subterranean Flora Study & Management Report — MRS 992/33 condition
- Neerabup Road Alignment Study/Management Report — MRS 992/33 condition
- Maintenance of 500m Buffer to the MRC Landfill Operation — MRS 992/33 condition
- Aboriginal and other Heritage Geology
- Water Regime in the Area
- Hazardous Site Declaration 2007 (Contaminated Sites Legislation)
- Incorporation Government Land Eastern Boundary TPD

Overall Project Financing

Water traffic solar

Financial projections