

## **ATTACHMENT 2**

Response to Submissions  
Shenton Park Regulatory Test



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**Response to Submissions –  
Shenton Park Regulatory Test**

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April 2012

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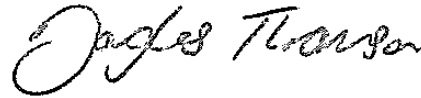
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# 1 Overview

## 1.1 Proposal

Demand for electricity in the Western Suburbs of Perth is forecast to continue growing into the future and this demand will increase the loading in the electricity network in the area. This is expected to result in the need for investment from summer 2015 to ensure customers continue to receive a reliable electricity supply. In addition, the age and condition of a significant number of the electricity network's transmission elements and substation assets in the area are expected to reach the end of their useful economic lives within the next 25 years.

Western Power recognises the importance of supplying reliable electricity supply to customers and has completed planning investigations to identify the most appropriate course of action to continue to meet the needs of its customers in the Western Suburbs.

In accordance with the requirements of chapter 9 of the Electricity Networks Access Code 2004, Western Power has prepared an Options Paper (DM# 9012523) for public consultation as part of the Regulatory Test process for a Major Augmentation Proposal to the Western Power network.

This Options Paper outlines the options considered by Western Power to address the need to increase the electricity supply capacity to the Western Suburbs area to meet forecast demand and presents the assessment of those options. Western Power made a draft recommendation supporting the option which in its view maximises the Net Benefit to those who generate, transport or consume electricity. This option proposes a series of network investments in the Western Suburbs, one of which involves the construction of a new 132/11kV substation at Shenton Park, which is the subject of this document.

The main elements of the Major Augmentation Proposal covered by the Options Paper are as follows:

- The establishment of a new 132kV/11kV zone substation at Shenton Park (SPK) containing 2 x 75MVA 132/11/11kV transformers and 2 line circuits
- The overhead line works associated with the 2 x 132kV WT-SPK line circuits (including the temporary stage involving the 132kV WT- NT line cut-in)
- The conversion and upgrade of the Shenton Park distribution network from 6.6kV to 11kV
- The decommissioning of the existing 66kV/6.6kV Shenton Park (SP) zone substation
- The conversion and upgrade of the Herdsman Parade zone substation distribution network from 6.6kV to 11kV
- The migration of the Herdsman Parade zone substation load to the new 132kV/11kV Shenton Park zone substation
- The decommissioning of the Herdsman Parade 66kV/6.6kV zone substation

The Options Paper was released for public consultation on the 19 March 2012 and was closed at 5 pm on 10 April. Western Power encouraged consultees to provide comment on the Shenton Park Options Paper and to proposed reasonable alternatives.

## 1.2 Regulatory Test Requirements

The Economic Regulation Authority (ERA) requires all major power augmentation proposals (proposals to upgrade the network) to be approved under clause 9.15 of the Electricity Networks Access Code 2004 (the Code). Under section 9.15 of the Code, Western Power must make a Regulatory Test submission to the ERA before it can commit to a reinforcement project.

The Regulatory Test requires Western Power to demonstrate, to the satisfaction of the ERA, that the major network augmentation has been:

*“properly assessed to determine whether it maximises the net benefit after considering all reasonable alternative options”.*

The Regulatory Test also requires Western Power to undertake a public consultation process which:

- is undertaken in accordance with the requirements of Appendix 7 of the Code
- gives all interested persons a reasonable opportunity to state their views and to propose alternative options

Western Power must demonstrate that it has had regard to those views and alternative options.

## 1.3 Public consultation

Clause 9.16(c) of the Code states the requirements for public consultation. The overall aim is to undertake a comprehensive and inclusive process which will meet the needs of the community, stakeholders, ERA and Western Power.

The consultation approach adopted included direct invitations to submit comments via forums, email or by post (see Appendix A for a copy of materials). The stakeholders invited included key industry representatives, major customers, State Government agencies, adjacent landowners (to the existing site) and the broader community (DM#9089965 contains the list of stakeholders invited via letter and email to attend). In total, 80 were directly invited.

Forums were held on the 27 March 2012 at the Hollywood Bowling Club (42 Smyth Road, Nedlands) at the 2.30 - 3.30pm and 5.30 - 6.30pm.

In total, 13 individuals attended. The sectors represented are tabled as follows.

Session	2.30-3.30pm
Sector	Number of Representatives
Government (State)	3
Government (Local)	3
Elected Officials	1

Residents (Local)	1
<b>Session</b>	<b>5.30-6.30pm</b>
<b>Sector</b>	<b>Number of Representatives</b>
Government (State)	2
Government (Local)	0
Elected Officials	0
Residents (Local)	3

Notes taken during the forums were treated as “verbal” submissions, at the attendee’s request.

Western Power was represented by officers from Network Planning, Regulation and Environment, Community and Approvals. Copies of the Options Paper (DM# 9012523), MS PowerPoint presentation (DM# 9171392) and information sheet (DM# 9190047) were offered.

Invitations to make submissions were also available via email or by post.

Two email submissions were received: one from Local Government and another from a major customer.

Postal submissions were also invited and Western Power received three postal submissions.

The public comment period ran from the 19 March 2012 to the 10 April 2012. The deadline for all submissions was 5 pm, 10 April 2012. No late submissions were received.

All verbal and written submissions have been summarized and incorporated in this report (see Table 2.1). In addition, the draft summaries of the workshops were provided to those that attended for their review and comment before the public comment period closed. No responses were received and as such, were finalised (with additional technical comments) and are attached in Appendix B.

## 1.4 Purpose of this Report

This Report presents a summary of the outcomes of the public consultation and submissions which will be published as part of Western Power’s submission to the Economic Regulation Authority (ERA) for a Major Augmentation Proposal and associated approvals.

## 1.5 Methodology

The Access Code requires Western Power to detail the methodology adopted in dealing with the information obtained and how regard was given to any alternative options proposed and issues raised during the consultation process.

For Shenton Park, the methodology adopted was to:



- accept all information received;
- review the validity and relevance of the information in relation to the proposal;
- identify opportunities to incorporate the new information and issues in the proposal;
- examine the alternative options with the original proposal against the key criteria/requirements for the augmentation.

Based on this analysis, Western Power determined how the information/issues/options would be incorporated and considered as part of the overall Western Terminal long-term Strategy.

Where information/issues/options were not considered appropriate, justification was provided.

## 2 Responses to submissions and queries

An important requirement by key statutory approval authorities is clarity over how stakeholder input was received and used in the formulation of the options and final option submitted for approval.

Table 2.1 outlines the issues raised from the submissions received during the formal consultation and engagement process for the Shenton Park Regulatory Test. A majority of submissions were received verbally during the forums (please refer to Appendix B for more detailed notes of these submissions). Two submissions were received in writing and are also captured in Table 2.1 to protect their confidentiality.

**Table 2.1: Responses to submissions and queries received during the formal consultation process**

Issue raised	Current proposal	Suggested amendment	Justification and rationale
<p><i>Electric and Magnetic Fields (EMF)</i> What are the readings along the existing and proposed lines?</p>	EMF readings have not been measured as a result of this proposal.	None at this point. The configuration, design and alignment of the lines will be investigated as part of the broader Western Terminal Network project. EMF readings have been taken along Hampden Road, Monash Avenue and Shenton Park (see Appendix C). These readings are less than the standards.	Western Power does not expect EMF levels to be a limiting factor to the current proposal considering the effects taken to minimize EMF levels through design and configuration arrangements. It is also not expected that the EMF readings will differ from current levels (see Appendix C for the latest readings along Hampden Road, Monash Avenue and at Shenton Park Substation).
<p><i>Alternative sites</i> Why haven't alternative sites been investigated as suitable for a substation including Western Terminal and the Shenton Park</p>	The current proposal is to build the new substation adjacent to the existing substation due to the availability of the land, the need to locate the substation close to the load area and the ability to reduce costs (up to \$15 million) due to the requirement for more extensive transmission circuit and distribution	None proposed at this stage.	Work has been progressing on the plans for the new substation at Shenton Park based on the need to reduce the footprint and reduce amenity impacts. This has been done in collaboration with key stakeholders and adjacent residents.

Issue raised	Current proposal	Suggested amendment	Justification and rationale
<p>rehabilitation site (due to be vacated after relocating to Fiona Stanley)?</p>	<p>cable rerouting if the substation is located elsewhere. The establishment of the Shenton Park substation within the Western Terminal site is likely to require remediation due to its former use as a landfill site. A site adjacent to the rail corridor was rejected as being too small and only 12 metres wide.</p>		
<p><i>Amenity</i> Why can't we have a larger number of smaller substations as opposed to fewer larger substations? What are the advantages and disadvantages of these options? We want to screen or underground them so we don't see them. We see this as a community benefit.</p>	<p>Strategy 3 involves Shenton Park &amp; Medical Centre being upgraded to 132/11kV, Herdsman Parade load transferred to Shenton Park, University load transferred to Medical Centre, Herdsman Parade &amp; University decommissioned.</p> <p>This involves extending the land area required for the Shenton Park and Medical Centre substations but also releasing the land at Herdsman Parade and University for other uses.</p>	<p>None</p>	<p>The use of a larger number of small substations represents the following advantages and disadvantages.</p> <p><b>Advantages</b></p> <ul style="list-style-type: none"> <li>• Potentially less footprint at the individual substation sites.</li> <li>• Substation located closer to the load slightly reducing length of distribution circuits.</li> </ul> <p><b>Disadvantages</b></p> <ul style="list-style-type: none"> <li>• Higher cost as more substations require more equipment (equipment can be shared at larger substations).</li> <li>• Large increase in the number and length of large transmission overhead lines with associated loss of visual amenity.</li> <li>• Overall, requires more land to meet the current and future load requirements due to the greater number of substations required.</li> <li>• Reduced network capacity and redundancy.</li> <li>• Higher energy losses due to more transmission and distribution lines required to connect substations within the network.</li> </ul> <p>The use of fewer larger substations represents the following advantages and disadvantages.</p>

Issue raised	Current proposal	Suggested amendment	Justification and rationale
			<p><b>Advantages</b></p> <ul style="list-style-type: none"> <li>• Allows for greater capacity and redundancy to cater for current load requirements and accommodate future load growth. This means more flexibility in the long term and that further network upgrades can be deferred.</li> <li>• As more lines are upgraded to 132kV, there is a reduction in the number and length of transmission lines, providing visual benefits to those living nearby. Reducing the overhead line length will also reduce maintenance costs.</li> <li>• Upgrading more of the 66kV substations and lines to 132kV in the Western Terminal area will reduce the total losses (energy loss through transmission), resulting in cost savings.</li> <li>• Enables the decommissioning of two substations (as proposed in Strategy 3) thereby improving the amenity of those living in close proximity.</li> </ul> <p><b>Disadvantages</b></p> <ul style="list-style-type: none"> <li>• Imposes amenity impact on those in close proximity to the chosen sites (although efforts will be taken to screen the substations post-construction through visual treatments).</li> </ul>
<p><i>Lines</i> Will there be more lines and where will they go? Will they be underground? Who will pay the cost and when will this happen?</p>	<p>The existing 132 kV transmission line, within the Lemnos Street Road reserve, will be reconfigured slightly to allow it to connect into the 132 kV Shenton Park substation. This line will remain in its existing alignment. As part of the Shenton Park substation project, minor reconfiguring to the 66 kV that currently connect to the substation, will take place. There is no intention for this line to be replaced with underground cable. As part of the Shenton Park substation</p>	<p>None</p>	<p>The work on the lines is a significant element of the overall Western Terminal Network and will require a substantial level of collaboration with key stakeholders. This is to ensure the options and line routes are the most effective, in terms of meeting the requirements from all key parties.</p>

Issue raised	Current proposal	Suggested amendment	Justification and rationale
	<p>project, minor reconfiguring to the 66 kV lines that currently connect to the substation, will be undertaken. These lines will remain in their existing alignments. Following the re-energizing of the Medical Centre Substation at 132 kV (current load forecasts indicate this will need to take place in 2018), Western Power will be replacing the two existing 66 kV lines between the Shenton Park and Medical Centre substations with two 132 kV lines. There is potential for these lines, or portions of these lines, to be installed as underground cable. Western Power will undertake a detailed options analysis process, involving all relevant stakeholders, prior to making a decision regarding whether overhead line or underground cable is to be used as well as selecting preferred alignments for these two lines.</p>		
<p><i>Impact on current configuration</i> This proposal will require us (a major customer) to upgrade our system. We are not ready for this and need to discuss this proposal further.</p>	<p>The proposed upgrade to 11 kV will require major customers feeding off the substation to undertake a series of upgrades at their sites.</p>	None	<p>Western Power will continue to work closely with each of the major customers impacted by the voltage upgrade to 11 kV to ensure the preferred strategy does not impact negatively on their operations. This will include assessing the impact of the proposed works on each major customer and identifying the most effective means of adapting their infrastructure to accommodate the proposed change. This will include any staging to ensure reliable power supplies throughout the project.</p>
<p><i>Engagement</i> We want to be involved in the process of designing</p>	<p>Western Power is committed to engaging all stakeholders on the Shenton Park project and Western Terminal Reinforcement project</p>	None	<p>Western Power has conducted three community workshops to seek input into the external finishes and layout of the substation and will hold a fourth workshop in June to address outstanding issues raised during</p>

<b>Issue raised</b>	<b>Current proposal</b>	<b>Suggested amendment</b>	<b>Justification and rationale</b>
the substation and lines and during construction activities.	throughout all of their phases. We will continue to do so for each project to ensure all key issues are dealt with to the satisfaction of both key the decision making authorities. This will occur during the design and planning phases as well as during construction and operation of the infrastructure.		previous workshops. The development application will be submitted once key stakeholders and affected landowners are satisfied with the proposal and key issues have been adequately addressed. For the lines, as noted, a collaborative approach will be taken to design the line route and configurations. This process will most likely commence in several years time as the line upgrades are not required till 2018.

In addition to the submissions outlining questions and concerns, the following submissions were received outlining that they had no comment regarding the proposal.

**Table 2.2: Submissions received providing no comment during the formal consultation process**

<b>Submitter ID</b>	<b>DM Reference</b>	<b>Support or No Comment</b>
Telstra	9219943	No comment
FESA	9219939	No comment
State Heritage Office	9219934	No comment and no interest in the site.

### 3 Final Option

In review of the comments received during the consultation phase, Western Power does not propose to make any modifications to the original proposal (Strategy 3).

As such, Western Power will submit Strategy 3 as the preferred option to the ERA for Regulatory Test approval.

However, a number of significant issues were raised during the consultation process and in order to address these concerns, Western Power will:

- Form a working group with representation from key stakeholders to undertake the options analysis for the future line routes for the Western Terminal Network.
- Continue to engage and involve in a meaningful way, key stakeholders in the design and planning for the Shenton Park substation to ensure key issues are addressed prior to the submission of the development application.
- Keep all key stakeholders informed of any changes as a result of either the ERA outcome or the development assessment process to ensure all are up to date on the status of the Shenton Park substation project.



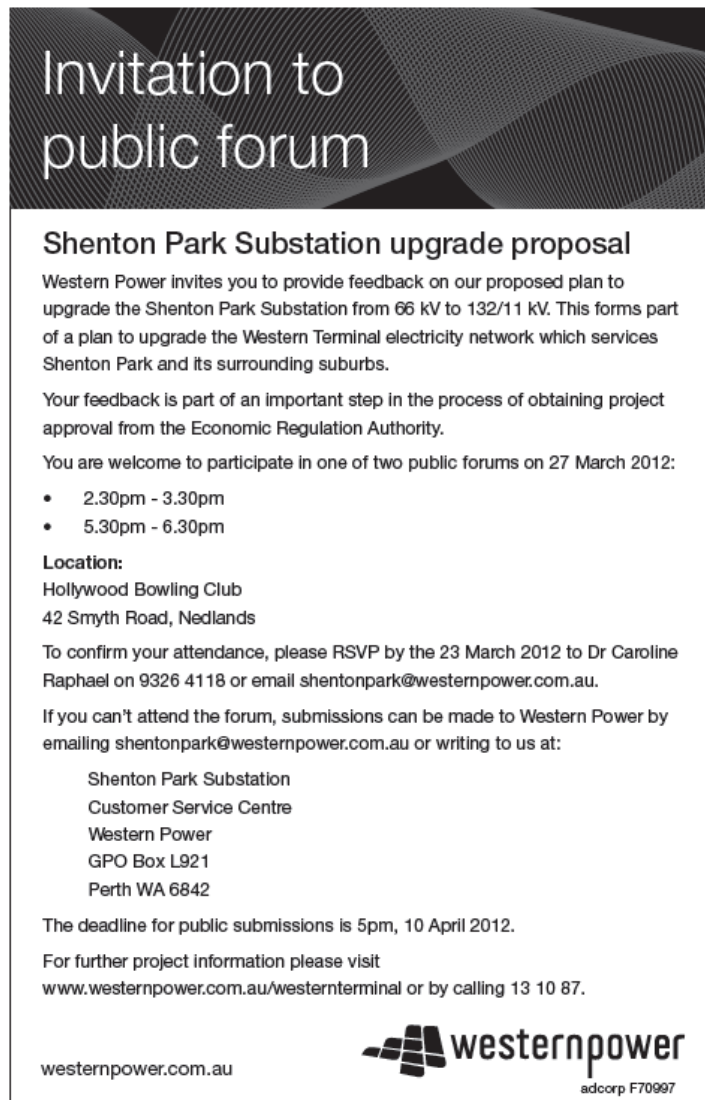
## **Appendix A - Invitations to input**

Advertisement placed in the following newspapers.

Media: WEST AUSTRALIAN  
Section: Early General News - (non-recruitment)  
Appearance: Saturday, 17-Mar-2012  
Size: 17 x 3 cmcol

Media: WESTERN SUBURBS WEEKLY  
Section: Early General News  
Appearance: Tuesday, 20-Mar-2012  
Size: 17 x 3 cmcol

Media: POST NEWSPAPERS  
Section: Early General News  
Appearance: Saturday, 17-Mar-2012  
Size: 17 x 3 cmcol



**Invitation to public forum**

**Shenton Park Substation upgrade proposal**

Western Power invites you to provide feedback on our proposed plan to upgrade the Shenton Park Substation from 66 kV to 132/11 kV. This forms part of a plan to upgrade the Western Terminal electricity network which services Shenton Park and its surrounding suburbs.

Your feedback is part of an important step in the process of obtaining project approval from the Economic Regulation Authority.

You are welcome to participate in one of two public forums on 27 March 2012:

- 2.30pm - 3.30pm
- 5.30pm - 6.30pm

**Location:**  
Hollywood Bowling Club  
42 Smyth Road, Nedlands

To confirm your attendance, please RSVP by the 23 March 2012 to Dr Caroline Raphael on 9326 4118 or email [shentonpark@westernpower.com.au](mailto:shentonpark@westernpower.com.au).


If you can't attend the forum, submissions can be made to Western Power by emailing [shentonpark@westernpower.com.au](mailto:shentonpark@westernpower.com.au) or writing to us at:

Shenton Park Substation  
Customer Service Centre  
Western Power  
GPO Box L921  
Perth WA 6842

The deadline for public submissions is 5pm, 10 April 2012.

For further project information please visit  
[www.westernpower.com.au/westernterminal](http://www.westernpower.com.au/westernterminal) or by calling 13 10 87.

[westernpower.com.au](http://westernpower.com.au)



adcorp F70997

## Sample letter sent to key stakeholders.



363 Wellington Street Perth WA 6000  
GPO Box L921 Perth WA 6842  
T: (08) 9326 4911 F: (08) 9326 4595  
www.westernpower.com.au  
Electricity Networks Corporation ABN 18 540 492 861

Our ref: DM# 9149614  
Contact: Douglas Thomson

12 March 2012

Mr Robert Pulella  
Executive Director - Competition, Markets and Electricity  
Economic Regulation Authority  
PO Box 8469  
Perth BC WA 6849

Dear Robert

### **Shenton Park Regulatory Test – Invitation to Input**

The existing 66 kV network through the Western Terminal is aged and operating close to full capacity. Western Power has conducted a detailed assessment of the entire Western Terminal load area over a 25 year time horizon and proposes a series of investments to reinforce the network. These investments are intended to support:

- forecast load growth from existing customers
- connection of prospective new loads
- align capacity expansion with asset replacement requirements

One of the key investments is upgrading the Shenton Park substation to 132/11kV. This investment requires Economic Regulation Authority approval (Regulatory Test Approval) to upgrade this substation.

### **Your Input**

Public forums will be held in March 2012 to provide information on Western Power's preferred option for the Western Terminal Reinforcement Project and what is proposed at Shenton Park. These forums provide an opportunity for all to ask Western Power questions on the preferred option as well as present alternative options for consideration. These forums will be held on the 27 March 2012 at the following times.

2.30-3.30pm or 5.30-6.30pm

The forums will be held at the Hollywood Bowling Club, 42 Smyth Road Nedlands WA 6009. Refreshments will be provided. To confirm your attendance, please RSVP by the 23 March 2012 to Dr Caroline Raphael on 9326 4118 or email [shentonpark@westernpower.com.au](mailto:shentonpark@westernpower.com.au)

If you can't attend a forum, submissions can be made via email or post. Email submissions to [shentonpark@westernpower.com.au](mailto:shentonpark@westernpower.com.au) and include in the subject header "Submission – Shenton Park Substation".

Submissions can also be posted to:

Shenton Park Substation  
Customer Service Centre  
Western Power  
GPO Box L921  
Perth WA 6842

**Public comment period**

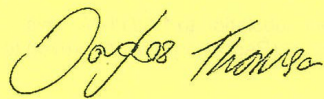
The public comment period will run from the 19 March to 10 April 2012. The **deadline** for submissions is **5pm, 10 April 2012**.

**Further information**

Additional information including the Options Paper will be available on our website [www.westernpower.com.au/westernterminal](http://www.westernpower.com.au/westernterminal) from the 19 March 2012 when the public consultation period commences. Queries can also be directed to 13 10 87 or via email [shentonpark@westernpower.com.au](mailto:shentonpark@westernpower.com.au)

If you have any queries, please do not hesitate to contact me on 9326 6174 or via email [douglas.thomson@westernpower.com.au](mailto:douglas.thomson@westernpower.com.au)

Yours sincerely



**Douglas Thomson**  
Planning and Projects Manager  
Network Planning & Development

## **Appendix B - Forum Notes**

# WESTERN POWER REGULATORY TEST - SHENTON PARK SUBSTATION UPGRADE PUBLIC FORUM

Venue: Hollywood Bowling Club, 42 Smyth Road, Nedlands  
2.40pm, Tuesday 27<sup>th</sup> March 2012

## WORKSHOP SUMMARY

### 1. WELCOME, PURPOSE AND PROCESS

Linton Pike, (facilitator) welcomed participants to the public forum and explained that the purpose of the forum was to:

- Outline the proposed options for the Western Terminal Network and Shenton Park upgrade;
- Discuss all options including alternative options;
- Seek stakeholder views and comments on the proposed option; and
- Outline the future steps in the approvals process.

The forum agenda is provided at Attachment One.

### 2. PROJECT OVERVIEW

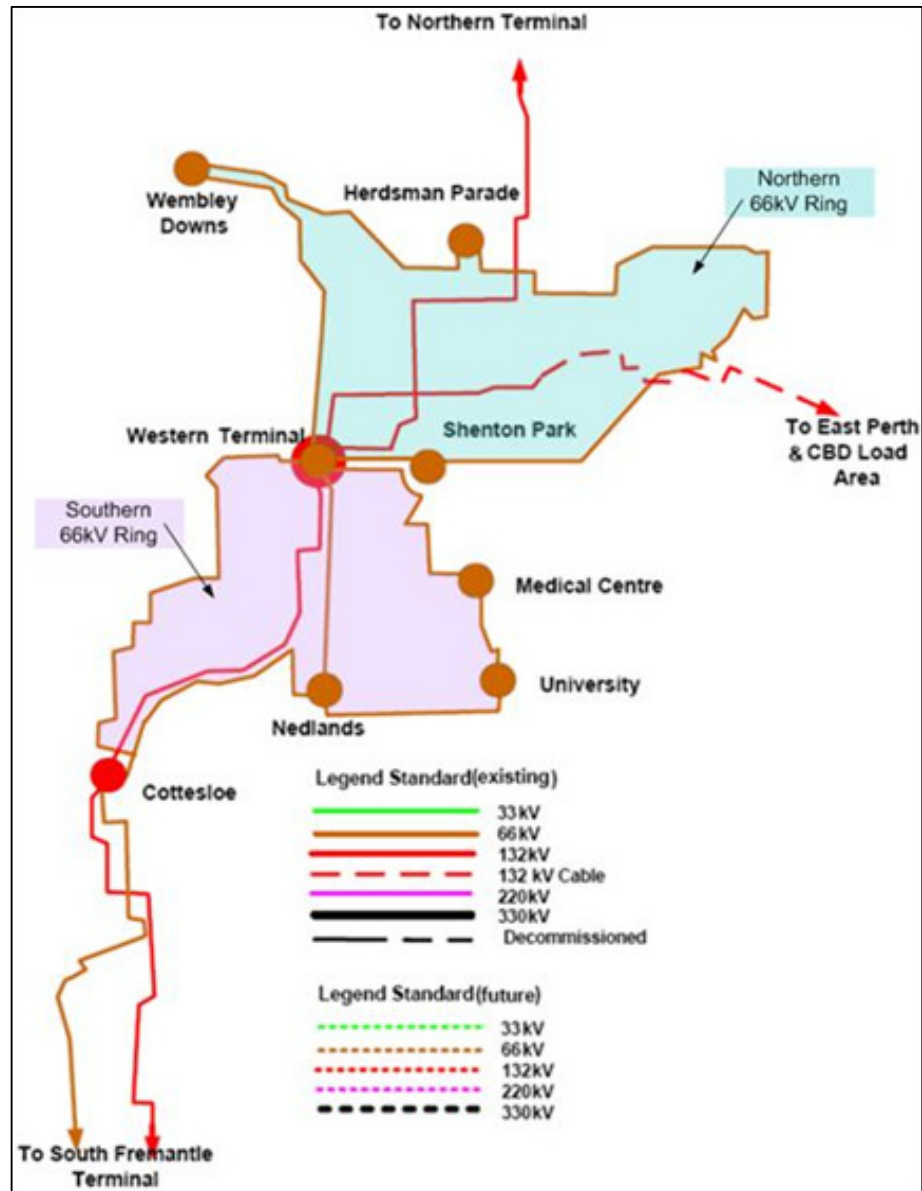
Douglas Thomson, Western Power, provided a project overview explaining that an Options Paper was released on 19 March 2012 for public comment and is available from the ERA website. The following key points are explained in more detail in the Options Paper.

The Western Terminal Load Area is shown below.



### The Western Terminal load area:

- Covers most of the South West Inner Metropolitan area, extending from City Beach and Wembley Downs in the north, to Mosman Park in the south, Nedlands and the Swan River in the east with the western boundary being the coastline;
- Contains mostly residential and commercial loads with some light industrial load and is a mature and well established region; and
- Presently supplies six substations in two distinct 66kV rings, one to the North and one to the South as shown below.

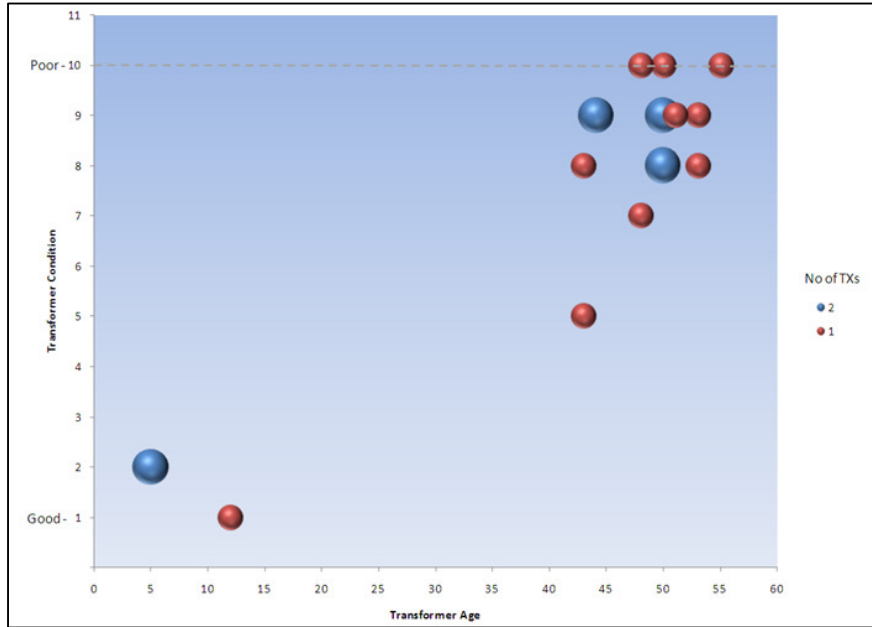


### The key investment drivers include:

- Asset age & condition;
- Organic load growth;
- New customer load (hospital); and
- Investment is required to deliver objectives in Western Power's Network Investment Strategy (NIS).

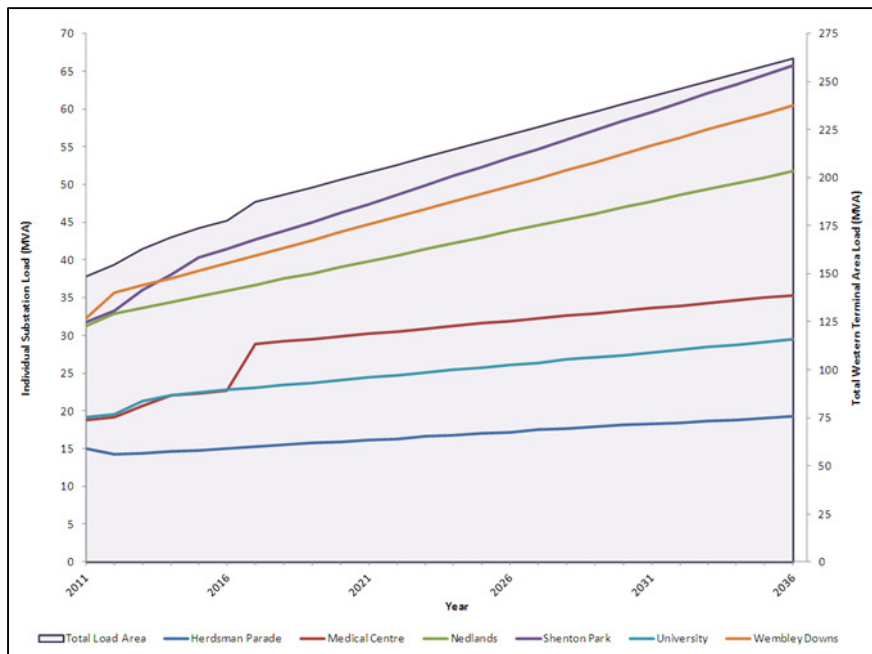
### Asset Condition

- The majority of the network assets in the Western Terminal Load area are greater than 40 years old and are approaching end of serviceable life;
- The majority of transformers in the Western Terminal load area will therefore require replacement within 5 to 15 years; and
- This is shown diagrammatically below. Red dots indicate sites with one transformer and blue indicate sites with two transformers.



### Load Forecast Steady Growth

- It is forecast that the load growth over the next 25 years will be mainly driven organically through residential and commercial customers as shown below.



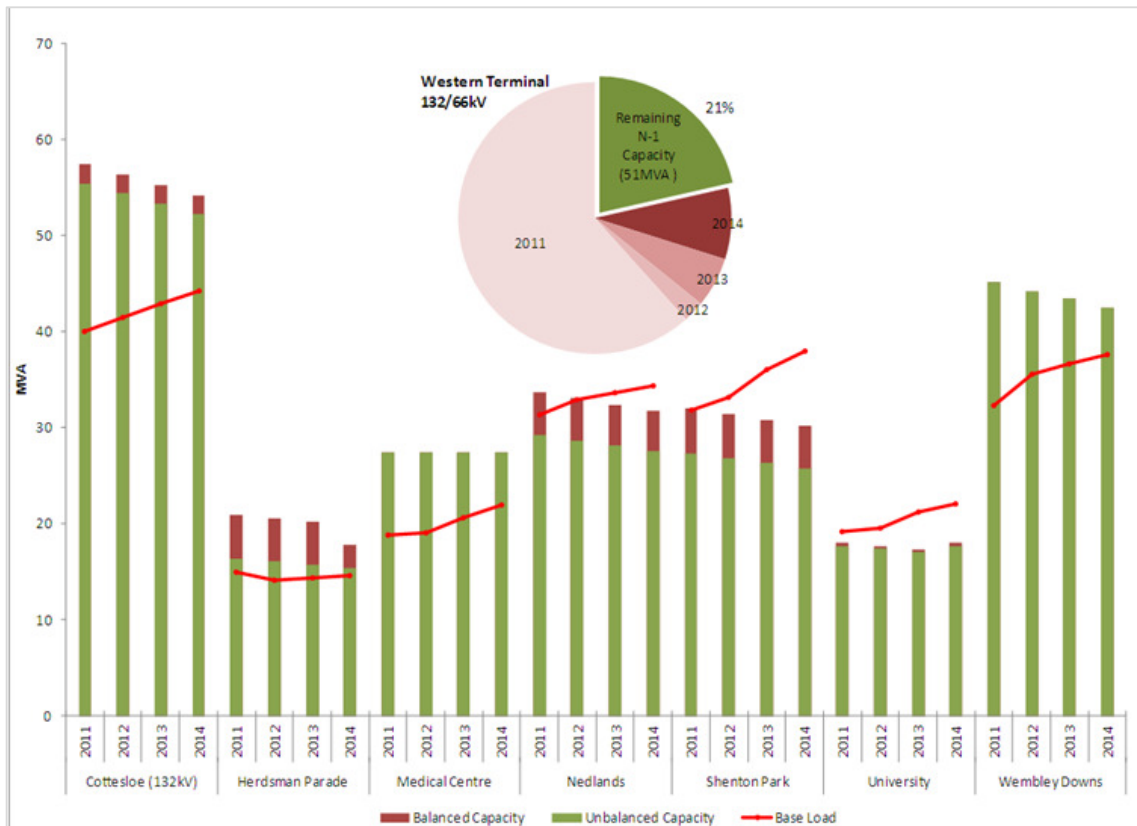


- Developments in the area are expected to be centred on the rationalisation of existing land uses such as higher density residential and commercial buildings, with very few greenfield developments as shown below.
- A medium size supermarket consumes around 1 MW of power.
- A typical house consumes around 4 or 5 kW. As such around 200 to 250 houses equates to a medium size supermarket.
- QEII consumes is around 15MW and expanding to 25 or 30MW and equates to around 30 Supermarkets.
- A substation typically supplies around 50MVA.

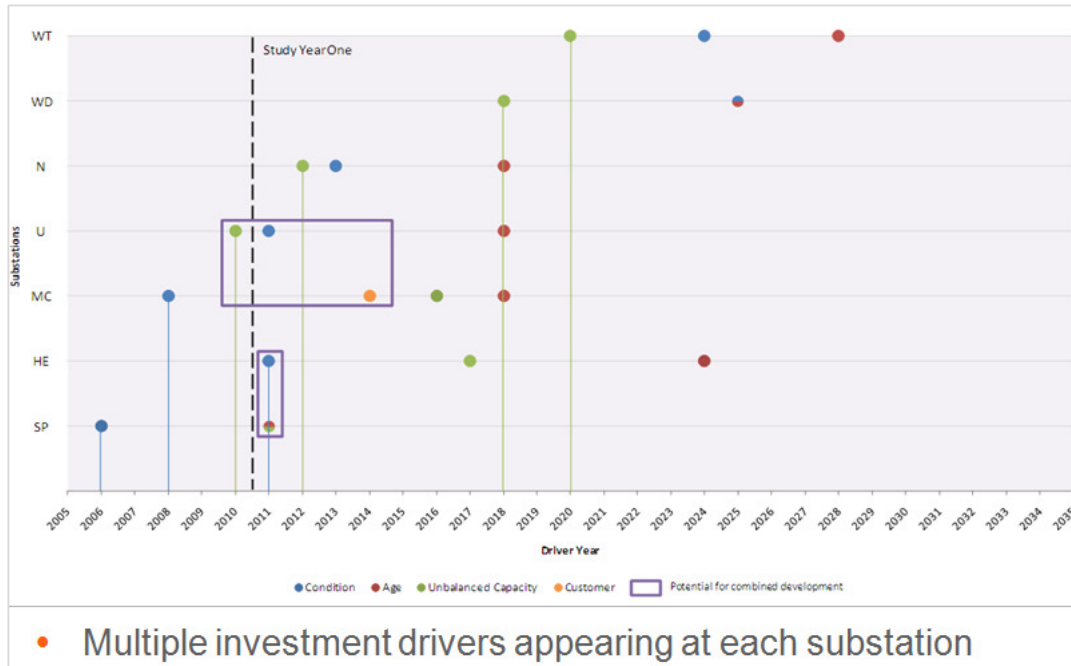
**Substation Capacity Shortfalls Emerging**

- There is a severe lack of transformer capacity throughout the Western Terminal load area in the immediate to short term.
- Of the six 66kV substations in the Western Terminal load area, Nedlands, Shenton Park and University would be non compliant with the Transmission Planning Guidelines by the 2011/12 if not for Distribution load transfers to adjacent substations.
- A shortfall against the planning guidelines does not mean failure to supply.
- The current substation capacity is shown below.

**Overview of Investment Drivers**



- The wholesale replacement of a significant proportion of the Western Terminal electrical transmission assets over the next 20 year or so presents an opportunity to consider revising the operating configuration and transmission voltage of the Western Terminal sub-system. This will allow rationalisation of the number of substation locations, overhead transmission lines and increase substation capacity.
- The logical groupings are shown over the page.



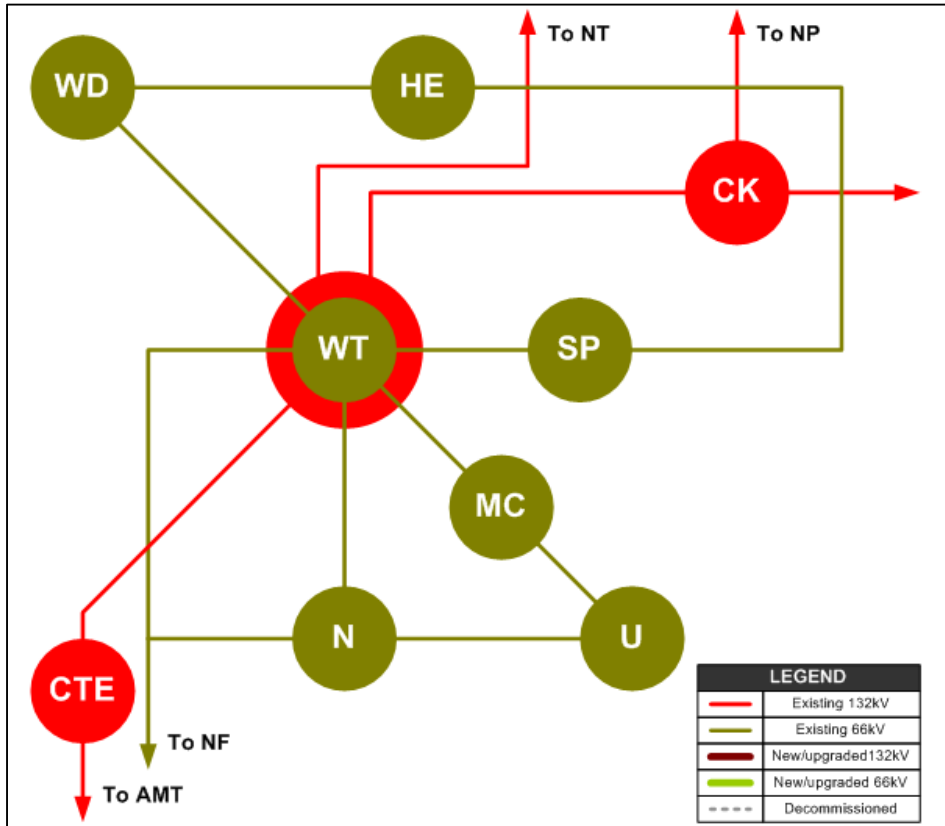
### Regulatory Requirements

- Under section 9.15 of the Electricity Networks Access Code 2004 (the Code), Western Power must make a Regulatory Test submission to the ERA before it can commit to a Major Augmentation.
- The Regulatory Test requires Western Power to demonstrate, to the satisfaction of the ERA, that the Major Augmentation has been “*properly assessed to determine whether it maximises the net benefit after considering all reasonable alternative options*”
- The Regulatory Test also requires Western Power to undertake a public consultation process which gives all interested persons a reasonable opportunity to state their views and to propose alternative options.
- The requirement for public consultation (as specified in Appendix 7 of the Code) is to undertake a comprehensive and inclusive process which will meet the needs of the ERA, Western Power, stakeholders and the community

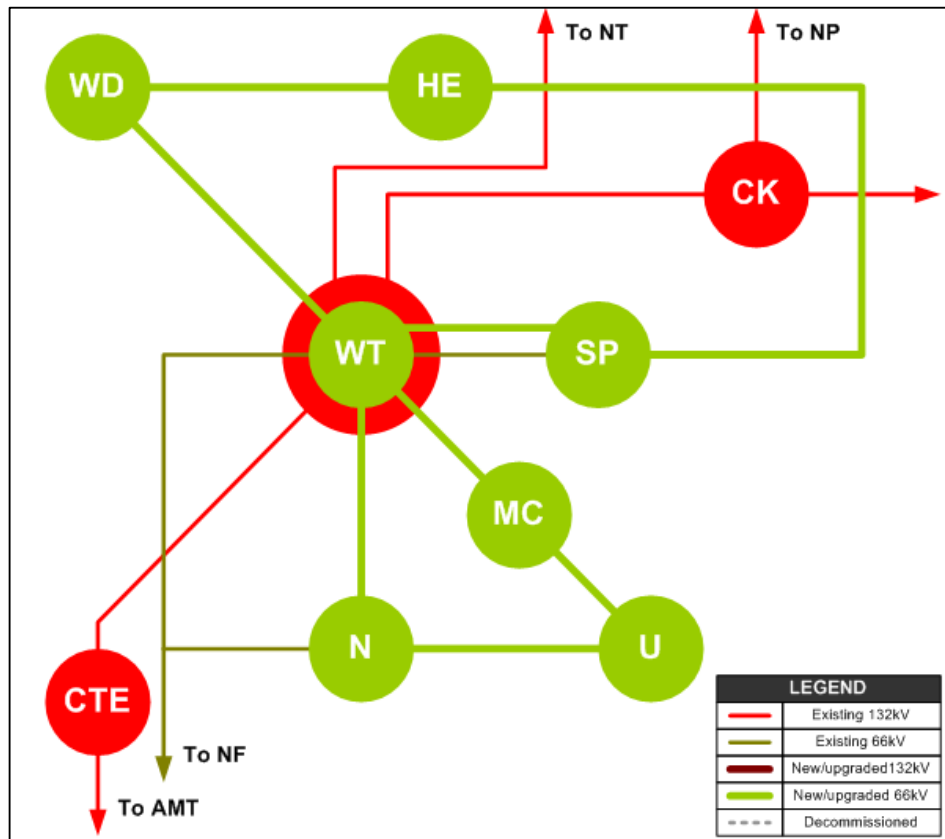
### Network Investment Strategies Considered

- Strategy 1: Retain 66 kV and upgrade network capacity
- Strategy 2: Shenton Park upgraded to 132/11kV, Herdsman Parade load transferred to Shenton Park and Herdsman Parade decommissioned
- Strategy 3: Shenton Park & Medical Centre upgraded to 132/11kV, Herdsman Parade load transferred to Shenton Park, University load transferred to Medical Centre, Herdsman Parade & University decommissioned.
- Strategy 4: Full 132 kV Migration of Shenton Park, Medical Centre, Wembley Downs & Nedlands with Herdsman Parade & University decommissioned.

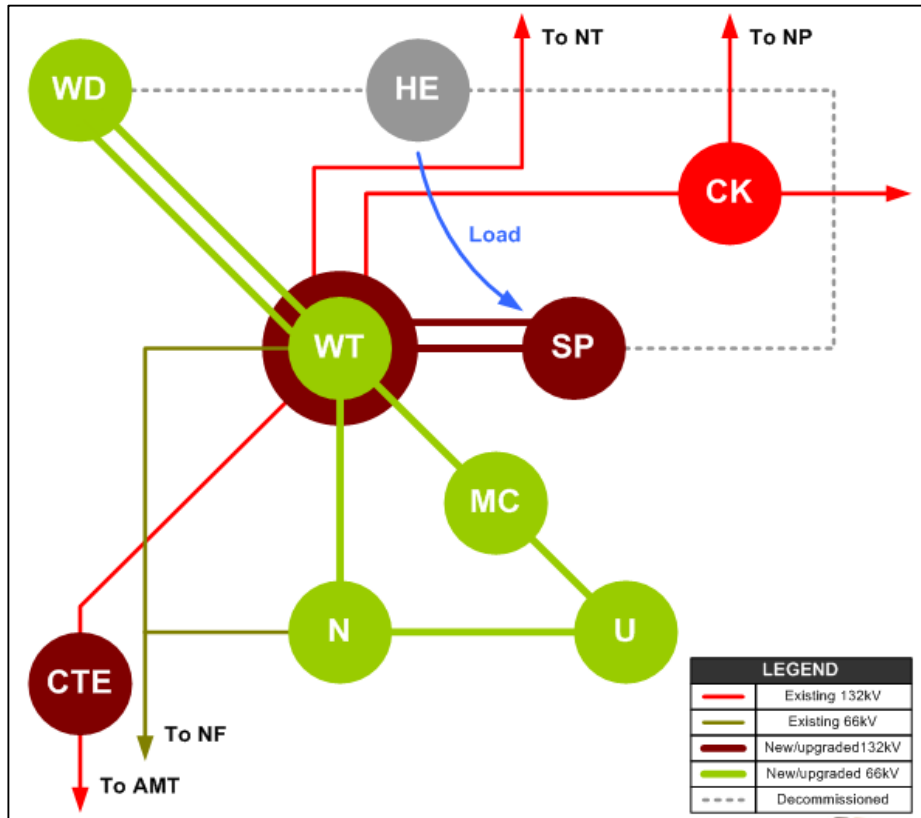
**Current Arrangement**



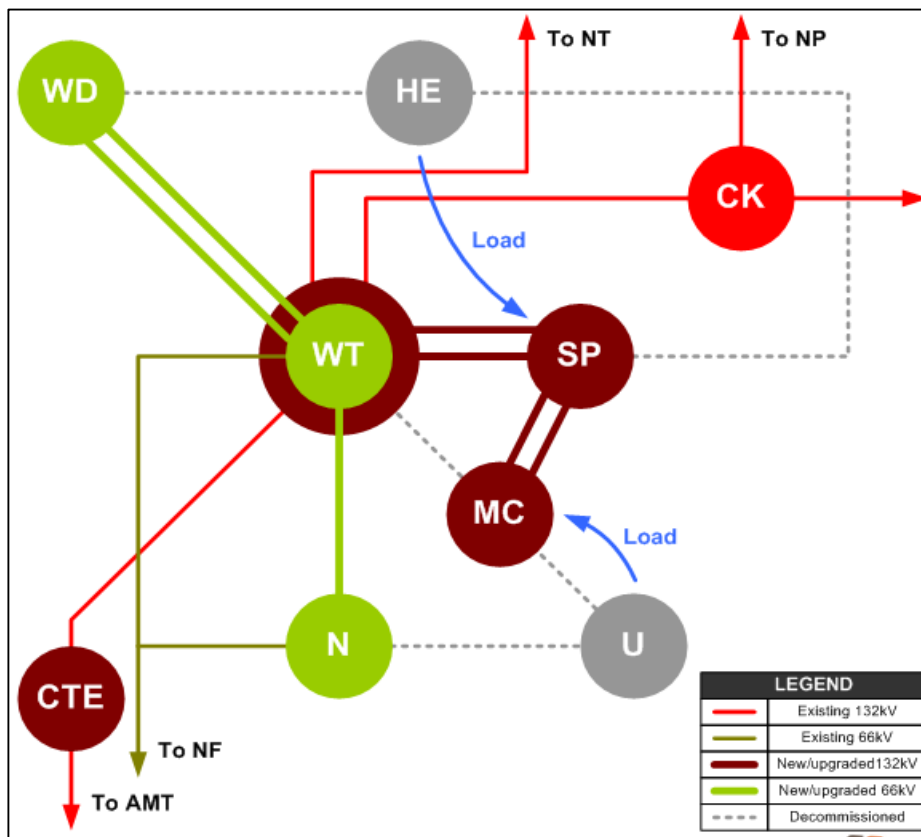
**Strategy 1**



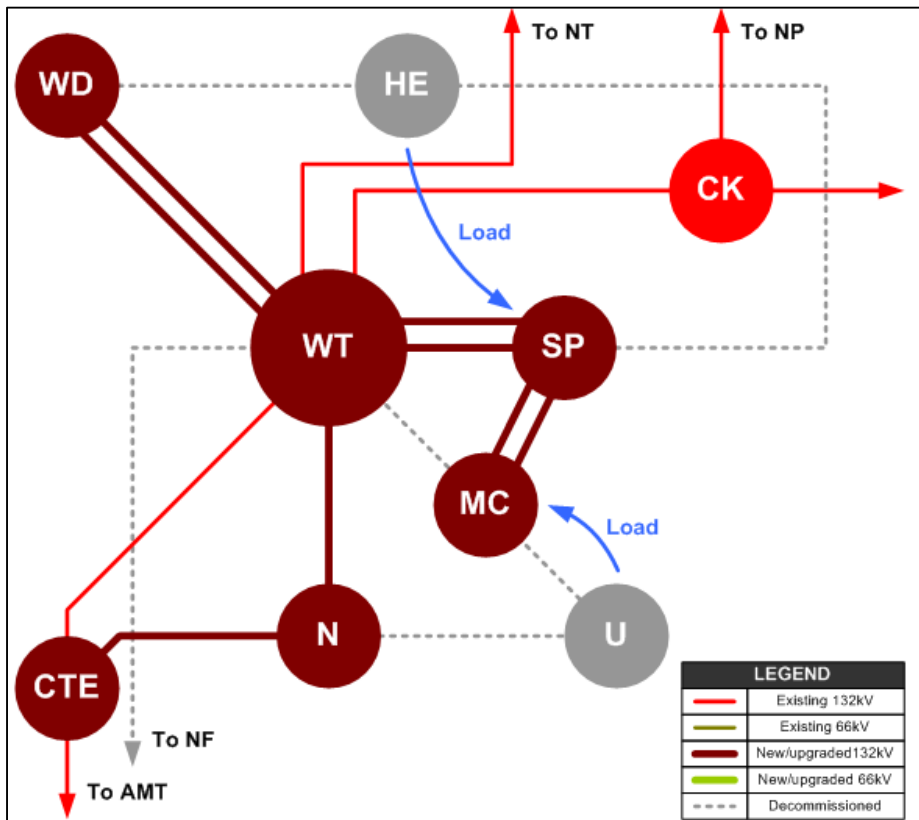
**Strategy 2**



**Strategy 3**



## Strategy 4



### Non-Network Options Considered

- Local Generation:
  - There are currently no existing connected generation of sufficient size or proposed new generators seeking connection in the Western Suburbs that could provide network control services in the foreseeable future.
- Demand Side Management (DSM):
  - The volume of DSM required to defer Shenton Park substation for one year in 2015 is 5350 kVA
  - Using \$500 / kVA, the total cost of a DSM solution would be at least \$2.68M
  - The cost benefit of deferring Shenton Park for one year in 2015 is \$1.9M

→ Based on these figures there would be no advantage in deferring the Shenton Park substation development using DSM due to the relative costs and benefits outlined.\*

### Comparison of Strategies

- The four capital investment development strategies identified were evaluated against a range of financial and technical performance metrics resulting in the identification of Strategy 3 as the most appropriate long term development solution for the Western Suburbs area.
- Medical Centre timing is customer driven and a regulatory test waiver exists.
- Options 3 & 4 are the same until 2018.
- A summary is provided in the table over the page.

\* Demand Side Management does not address the need to upgrade ageing assets.

Strategy	Description	NPC, \$M	Remaining TX MVA at 2035
1	Retain 66kV and upgrade network capacity	117.7	42
2	Shenton Park Upgraded to 132kV with Herdsman Parade decommissioned.	114.8	92
3	Shenton Park & Medical Centre Upgraded to 132kV with Herdsman Parade & University decommissioned.	112.1	107
4	Full 132kV Migration of Shenton Park, Medical Centre, Wembley Downs & Nedlands with Herdsman Parade & University decommissioned.	119.4	117

**Strategy 3** is recommended as it meets all the required technical performance standards whilst minimising the present value costs across the 25 year period.

NPC – Net Present Cost

### Recommendation - Strategy 3

- Based on the conclusion drawn from the analysis and Western Power obligations under the Electricity Networks Access Code 2004 for Major Augmentations it is recommended that the above investments be taken forward.
- The overhead line works includes the temporary stage involving the 132kV WT- NT line cut-in
- The total cost has been determined as part of the A1 estimate process using more refined figures than were available during the initial options analysis.
- It is recommended that the following investments be taken forward:
  - New 132kV/11kV zone substation at Shenton Park (SP) containing 2 x 66MVA 132/11/11kV transformers and 2 line circuits
  - Overhead line works associated with the 2 x 132kV WT-SP line circuits
  - Conversion and upgrade of the Shenton Park & Herdsman Parade distribution networks from 6.6kV to 11kV
  - The decommissioning of the existing 66kV/6.6kV Shenton Park (SP) and Herdsman Parade zone substations
  - The migration of the Herdsman Parade load to the new 132kV/11kV Shenton Park zone substation
- Total cost = \$35.68M in nominal dollars including distribution upgrade costs, project oncosts and risk.
- The target energisation date for the new Shenton Park substation is Oct 2015.

### Regulatory Test Submission – Proposed Schedule

- 19th March 2012 – Commence Public Consultation Period (15 days)
- 27th March 2012 – Public Forum
- 10th April 2012 – End of Public Consultation
- 13th April 2012 – Review of Submissions
- 7th May 2012 – Submission of the Major Augmentation Proposal for Regulatory Test

### 3. QUESTION AND ANSWER SESSION

A question and answer session followed and is summarised below.

<b>Q</b>	Where is Western Terminal getting its power from?
<b>A</b>	The bulk of power is coming from the Northern Terminal which transfers the 330kV power through the network infrastructure. However as Western Power runs an interconnected network, power can also be transferred from Southern Terminal via East Perth and South Fremantle substations depending on particular operating arrangements.
<b>Q</b>	The diagram shows a 132 kV line from Western Terminal to East Perth is it going to or coming from East Perth?
<b>A</b>	An interconnected system is in place and power flows in either direction to match changing demand profiles. Northern Terminal and Southern Terminal are the transmission injection points and power moves between them to match demand. This maintains flexibility with different supply origins.
<b>Q</b>	It seems that simplistically the network options include a range from a few large substations to a lot of small larger substations. A better understanding of the advantages and disadvantages of each end of the continuum would be beneficial. This seems like the least cost solution but we need to also understand the impacts for local communities. Does more substations mean more lines or more separation etc. These are the things of interest to our communities. The community would prefer smaller scale infrastructure that could be undergrounded or screened. Strategies 3 and 4 appear to result in the removal of a line and seem to offer advantages. Conversely, it may be more lower voltage lines that can be undergrounded may be better. This is the sort of discussion that would help in the comparison.

<p>A</p>	<p>The cost of energy production is significant and it is relatively cheap for distribution (household voltages). Transmission is essential but more expensive (at higher voltages).                  Maintenance is easier in a visible system. Underground is different and more problematic.                  If we were designing Western Terminal from scratch today the optimal solution must consider capital and recurrent costs.                  New and emerging technologies and equipment provide opportunities. Transformer technology is now more efficient with less losses. The key issue is heat dissipation with more efficient transformers generating less heat with fewer challenges. This allows us to get more from some sites and de-commission others as a community benefit.</p> <p>Smaller and more substations represent the following advantages and disadvantages.</p> <p><b>Advantages</b></p> <ul style="list-style-type: none"> <li>• Potentially less footprint at the individual site.</li> <li>• More direct feed of electricity to the required load area.</li> </ul> <p><b>Disadvantages</b></p> <ul style="list-style-type: none"> <li>• Overall, requires more land to meet the current and future load requirements due to the great number of substations required.</li> <li>• Less capacity and even less spare capacity created by more smaller substations.</li> <li>• Less efficient from a cost perspective as more substations require more equipment (rather than sharing which is possible at larger substations).</li> <li>• More energy loss due to more transmission and distribution lines required to connect substations within the network.</li> </ul> <p>Larger and less substations represent the following advantages and disadvantages.</p> <p><b>Advantages</b></p> <ul style="list-style-type: none"> <li>• Allows for greater capacity and more spare capacity to cater for current load requirements plus predicted load growth. This means more flexibility in the long term and that further network upgrades can be deferred.</li> <li>• As more lines are upgraded to 132kV, there is a reduction in the number of line routes utilised and overall line length, providing visual benefits to those living nearby. Reducing the overhead line length will also reduce maintenance costs.</li> <li>• Upgrading more of the 66kV substations and lines to 132kV in the Western Terminal area will reduce the total losses (energy loss through transmission), resulting in cost savings.</li> <li>• Enables the decommissioning of two substations (as proposed in Strategy 3) thereby improving the amenity of those living in close proximity.</li> </ul> <p><b>Disadvantages</b></p> <ul style="list-style-type: none"> <li>• Imposes amenity impact on those in close proximity to the chosen sites (although efforts will be taken to screen the substations post-construction through visual treatments).</li> </ul>
<p>Q</p>	<p>Can 132kV be undergrounded?</p>
<p>A</p>	<p>Yes with considerable associated cost with a cost differential of around 5 to 6 times.</p>
<p>Q</p>	<p>Who would pay for undergrounding?</p>
<p>A</p>	<p>There are programs for distribution (household supplies) undergrounding with Western Power, local governments and customer funded solutions.                  Transmission (high voltage) undergrounding is a cost to government or a developer if it is an enabling element.                  All are generally subject to the Economic Regulatory Test however some exemptions do exist.</p>



<b>Q</b>	More smaller substation may be a better option if strategically located. Those in a non residential area or buffer can be as big as is required. Could we co-locate Shenton Park with Western Terminal or other sites?
<b>A</b>	<p>The transformers are one thing but we also have the lines to consider and we still need to get higher voltages across the distribution area . The more sites the more lines we have.</p> <p>Shenton Park services the local community and moving the substation to Western Terminal means that the lines will have to come back to Shenton Park and step down at a transformer.</p> <p>A study was undertaken during the initial planning stages considering the use of Western Terminal and other sites as an alternative to developing Shenton Park.</p> <p>In order to utilise Western Terminal, possible remediation works was identified prior to construction due to it being a former landfill site. More vegetation clearing would also be required than with the existing Shenton Park site.</p> <p>Although there are fewer residential properties in the immediate vicinity, the development will have a large impact on the equestrian centre. There will major traffic disruption spanning many weeks during the distribution cabling phase of the project.</p> <p>In order to connect the existing distribution network to Western Terminal, 16 cable circuits would need to be installed. Additionally, Western Terminal would require a 132kV substation extension and necessary 132kV circuit works.</p> <p>Overall, the use of Western Terminal as an alternative site was estimated to cost around \$15M more than utilising the existing Shenton Park site.</p>
<b>Q</b>	Will the new Shenton Park be bigger?
<b>A</b>	Yes but there will be a reduction from 3 to 2 transformers and the de-commissioning of Herdsman substation. This is a net result of 5 less transformers.
<b>Q</b>	There have been earlier meetings for Shenton Park substation site hasn't this been decided?
<b>A</b>	<p>Earlier planning has been done for the Shenton Park site with long planning lead times. The Regulatory Test is needed to secure the enabling funding in a parallel process.</p> <p>The Shenton Park transformers are old and require replacement. The design workshops have been to plan the Shenton Park site as a two transformer site.</p>
<b>Q</b>	What happens to the Medical Centre substation?
<b>A</b>	The Medical Centre substation will be upgraded to 132kV. This is driven by a customer funded project to upgrade the QEII site. Western Power has obtained a Regulatory Test waiver from the ERA for this component of work.
<b>Q</b>	How do we get from Shenton Park to Medical Centre and does it imply a new line?
<b>A</b>	<p>The Substation planning comes first. Then the line placement follows.</p> <p>The Options document covers the advantages and disadvantages in more detail – reducing line length and substation site removal and capacity of existing lines</p>
<b>Q</b>	We need to better understand the implications for new lines and other factors for Shenton Park.
<b>A</b>	<p>It is an operating substation. Western Power has a management order over the adjacent Crown land and will establish the new substation first and then de-commission the old site.</p> <p>If the ERA does not support the concept then we will need to look for other options.</p>
<b>Q</b>	Shouldn't we have done this first?
<b>A</b>	<p>We want to be working with communities to understand the implications and ideas to inform the Regulatory Test debate on a “chicken and egg” scenario.</p> <p>More efficient transformers and switch gear means smaller and less intrusive equipment results.</p>
<b>Q</b>	Does the connection between Medical Centre and UWA require a new line?

<b>A</b>	Some of the power load may be transferred through the distribution network (existing network) but we cannot say without a more thorough assessment. We would underground the lines in relevant areas where possible. Things may change in the future – eg light rail or other. Strategies 3 & 4 of the proposed Western Terminal reinforcement involve the decommissioning of the existing University site and the Nedlands-University-Medical Centre 66kV circuit. The University load will be transferred via the Distribution network (11kV) to the new Medical Centre site. Therefore no additional transmission lines are required to accommodate the University load as part of this proposal. This is based on the current load forecasts over a 25 year period, however if there are any unforeseen block load developments or significant changes in load growth, these planning studies will need to be revised.
<b>Q</b>	If an additional link is needed would a dedicated corridor be needed for this purpose?
<b>A</b>	We will be undertaking a more collaborative process with criteria and options analysis to drive the selection process.
<b>Q</b>	What is the differential cost of undergrounding 66kV v 132kV lines?
<b>A</b>	Similar costs.
<b>Q</b>	If UWA site is de-commissioned then what feeds the power back?
<b>A</b>	Distribution lines must be upgraded to feed the power back to the area.
<b>Q</b>	Who owns the UWA and Herdsman sites?
<b>A</b>	UWA site is UWA owned land. Western Power owns the Herdsman site.
<b>Q</b>	Does the load forecasting include light rail?
<b>A</b>	No but is usually powered at distribution voltage – domestic capacity.

#### 4. WORKSHOP SESSION

The workshop session provided an opportunity for participants to provide input to the various options. The following feedback was received:

- Strategy 3 is seen as the cheapest and may be the best but:
  - A better understanding of the associated social implications for local communities is needed (more or less lines and substations); and
  - Possibly look for options that de-commission sites in residential areas rather than non-residential areas to inform the Regulatory Test debate.
- PTA asked that all impacts for existing or planned future rail are considered with more input from PTA;
- Separation of lines is needed to provide some contingency and safety (that is, to ensure power is supplied if one line is down for maintenance or repair or due to faults);
- Ensure sufficient capacity and space is available at QEII to service this need in the future;
- Advise City of Nedlands of associated buffer or other impacts for inclusion in the Town Planning Scheme particularly for protecting future line routes;
- Fewer sites with localised impacts are the best solution; and
- Synergy feedback was positive and commended the Discussion Paper and resultant recommendations which help reliability and supply certainty.

#### 5. NEXT STEPS

The next steps in the process include:

- Stakeholder feedback will be consolidated – mail, post, email, etc;

- Western Power will consider the comments and modify the strategies if and where appropriate;
- An ERA submission will be prepared subject to prior review by the Western Power Board;
- If supported it then goes to the ERA; and
- The detailed plans for Shenton Park won't be finalised unless and until Western Power get an indication from the ERA for their support.

Linton thanked all participants for their positive involvement and the forum closed at 4:15pm.

# WESTERN POWER REGULATORY TEST - SHENTON PARK SUBSTATION UPGRADE

## PUBLIC FORUM

**Venue: Hollywood Bowling Club, 42 Smyth Road, Nedlands  
Tuesday 27 March 2012, 2.30-3.30pm**

### FORUM PURPOSE:

- To outline the proposed options for the Western Terminal Network and Shenton Park upgrade
- Discuss all options including alternative options
- Seek stakeholder views and comments on the proposed option
- Outline the future steps in the approvals process

### AGENDA

START AT	ITEM	BY
2.30pm	Refreshments, tea and coffee provided on arrival	
2:40	Welcome, purpose and process	Linton Pike
2:45	Project overview	Douglas Thomson
3:00	Questions and Answers	All
3:10	Workshop Session: Discussion of alternative options	All
3.20	Feedback	All
3.25	Next Steps	Douglas Thomson
3:30pm	Close	

# WESTERN POWER REGULATORY TEST - SHENTON PARK SUBSTATION UPGRADE PUBLIC FORUM

Venue: Hollywood Bowling Club, 42 Smyth Road, Nedlands  
5.40pm, Tuesday 27<sup>th</sup> March 2012

## WORKSHOP SUMMARY

### 1. WELCOME, PURPOSE AND PROCESS

Linton Pike, (facilitator) welcomed participants to the public forum and explained that the purpose of the forum was to:

- Outline the proposed options for the Western Terminal Network and Shenton Park upgrade;
- Discuss all options including alternative options;
- Seek stakeholder views and comments on the proposed option; and
- Outline the future steps in the approvals process.

The forum agenda is provided at Attachment One.

### 2. PROJECT OVERVIEW

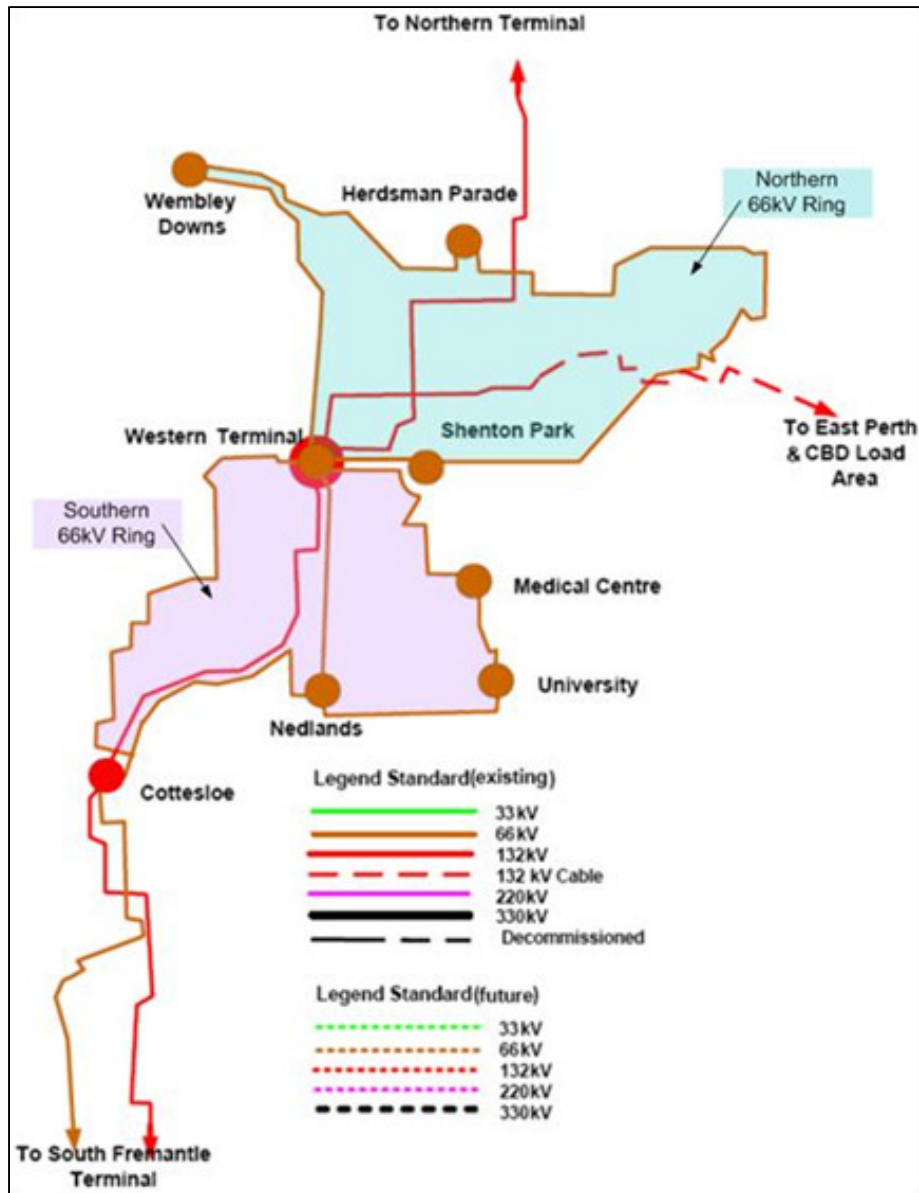
Douglas Thomson, Western Power, provided a project overview explaining that an Options Paper was released on 19 March 2012 for public comment and is available from the ERA website. The following key points are explained in more detail in the Options Paper.

The Western Terminal Load Area is shown below.



### The Western Terminal load area:

- Covers most of the South West Inner Metropolitan area, extending from City Beach and Wembley Downs in the north, to Mosman Park in the south, Nedlands and the Swan River in the east with the western boundary being the coastline;
- Contains mostly residential and commercial loads with some light industrial load and is a mature and well established region; and
- Presently supplies six substations in two distinct 66kV rings, one to the North and one to the South as shown below.

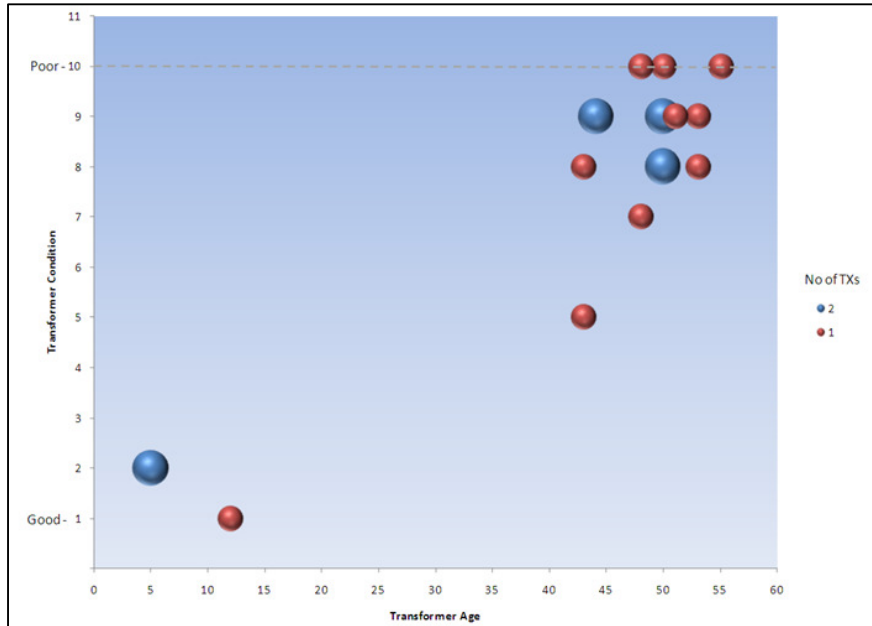


### The key investment drivers include:

- Asset age & condition;
- Organic load growth;
- New customer load (hospital); and
- Investment is required to deliver objectives in Western Power's Network Investment Strategy (NIS).

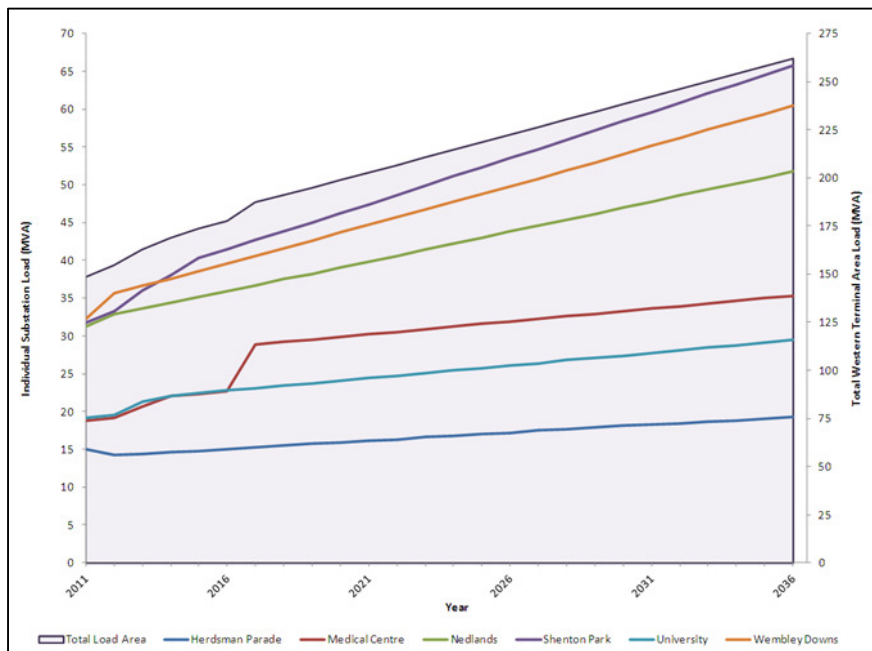
**Asset Condition**

- The majority of the network assets in the Western Terminal Load area are greater than 40 years old and are approaching end of serviceable life;
- The majority of transformers in the Western Terminal load area will therefore require replacement within 5 to 15 years; and
- This is shown diagrammatically below. Red dots indicate sites with one transformer and blue indicate sites with two transformers.



**Load Forecast Steady Growth**

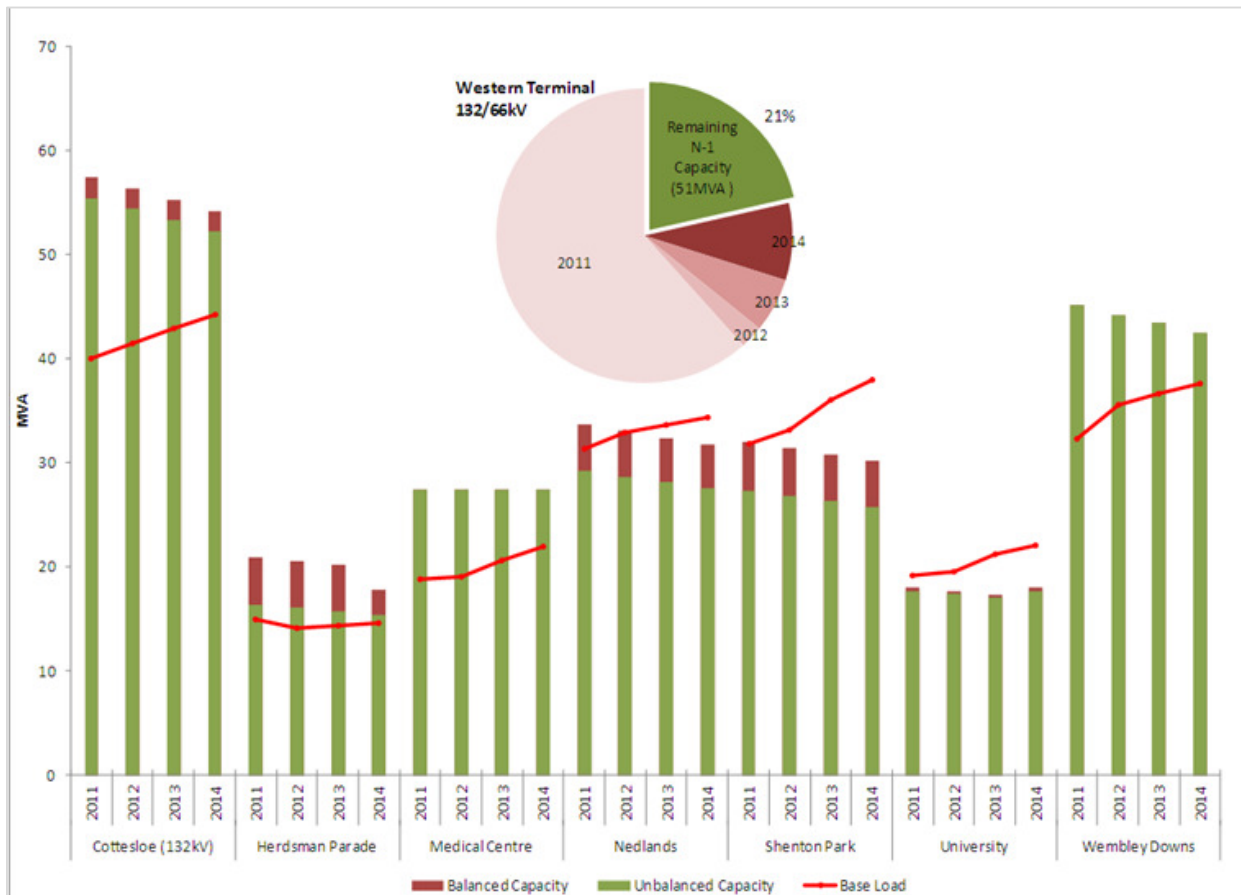
- It is forecast that the load growth over the next 25 years will be mainly driven organically through residential and commercial customers as shown below.



- Developments in the area are expected to be centred on the rationalisation of existing land uses such as higher density residential and commercial buildings, with very few greenfield developments as shown below.
- A medium size supermarket consumes around 1 MW of power.
- A typical house consumes around 4 or 5 kW. As such around 200 to 250 houses equates to a medium size supermarket.
- QEII consumes is around 15MW and expanding to 25 or 30MW and equates to around 30 Supermarkets.
- A substation typically supplies around 50MvA.

**Substation Capacity Shortfalls Emerging**

- There is a severe lack of transformer capacity throughout the Western Terminal load area in the immediate to short term.
- Of the six 66kV substations in the Western Terminal load area, Nedlands, Shenton Park and University would be non compliant with the Transmission Planning Guidelines by the 2011/12 if not for Distribution load transfers to adjacent substations.
- A shortfall against the planning guidelines does not mean failure to supply.
- The current substation capacity is shown below.



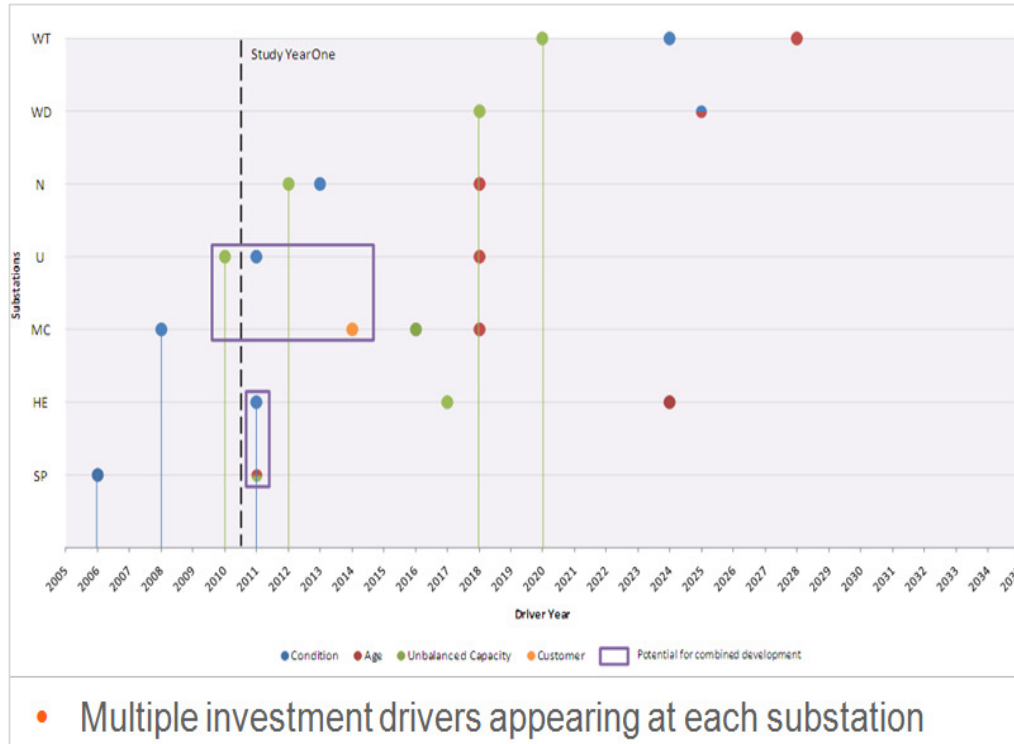
**Overview of Investment Drivers**

- The wholesale replacement of a significant proportion of the Western Terminal electrical transmission assets over the next 20 year or so presents an opportunity to consider revising the operating configuration and transmission voltage of the Western Terminal sub-



system. This will allow rationalisation of the number of substation locations, overhead transmission lines and increase substation capacity.

- The logical groupings are shown over the page.



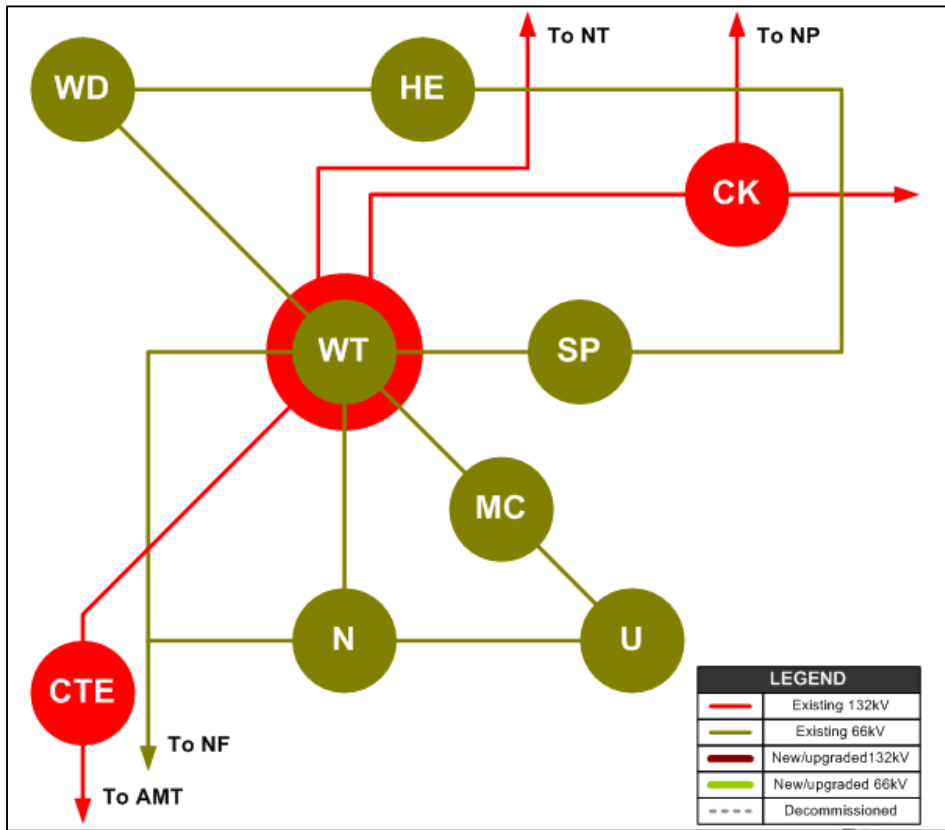
### Regulatory Requirements

- Under section 9.15 of the Electricity Networks Access Code 2004 (the Code), Western Power must make a Regulatory Test submission to the ERA before it can commit to a Major Augmentation.
- The Regulatory Test requires Western Power to demonstrate, to the satisfaction of the ERA, that the Major Augmentation has been “*properly assessed to determine whether it maximises the net benefit after considering all reasonable alternative options*”
- The Regulatory Test also requires Western Power to undertake a public consultation process which gives all interested persons a reasonable opportunity to state their views and to propose alternative options.
- The requirement for public consultation (as specified in Appendix 7 of the Code) is to undertake a comprehensive and inclusive process which will meet the needs of the ERA, Western Power, stakeholders and the community

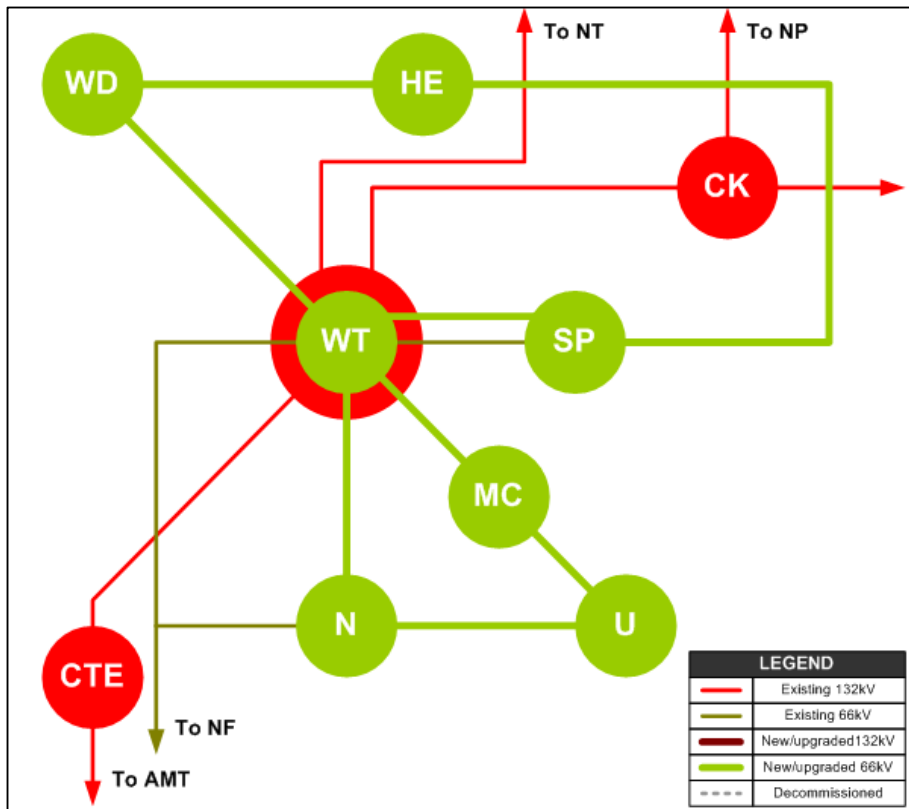
### Network Investment Strategies Considered

- Strategy 1: Retain 66 kV and upgrade network capacity
- Strategy 2: Shenton Park upgraded to 132/11kV, Herdsman Parade load transferred to Shenton Park and Herdsman Parade decommissioned
- Strategy 3: Shenton Park & Medical Centre upgraded to 132/11kV, Herdsman Parade load transferred to Shenton Park, University load transferred to Medical Centre, Herdsman Parade & University decommissioned.
- Strategy 4: Full 132 kV Migration of Shenton Park, Medical Centre, Wembley Downs & Nedlands with Herdsman Parade & University decommissioned.

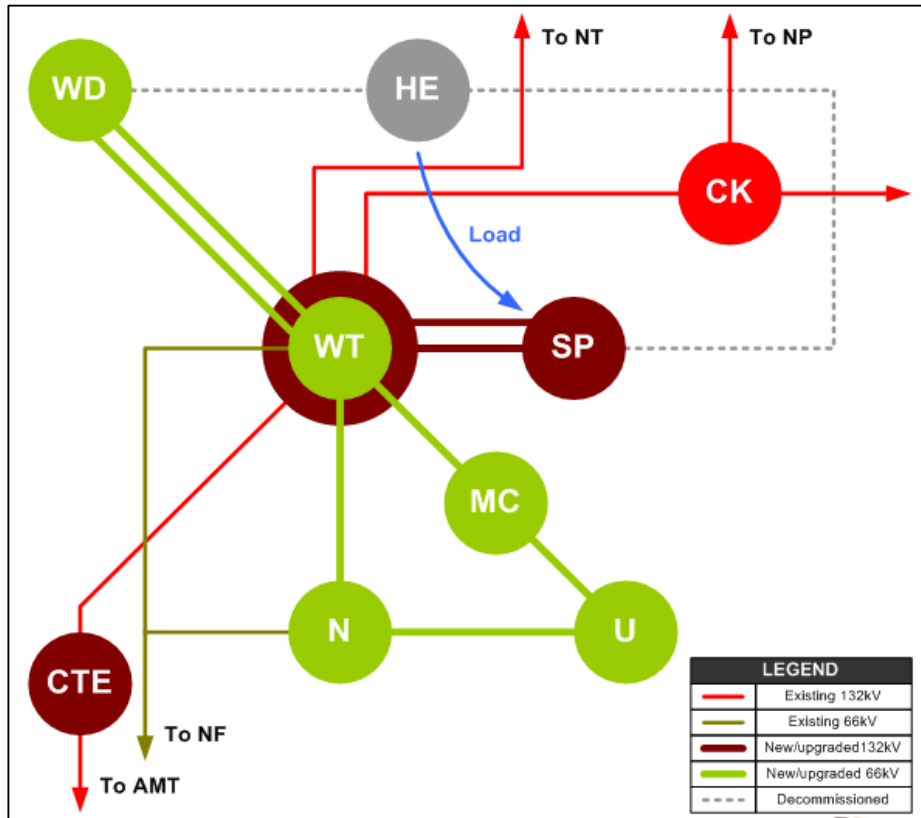
### Current Arrangement



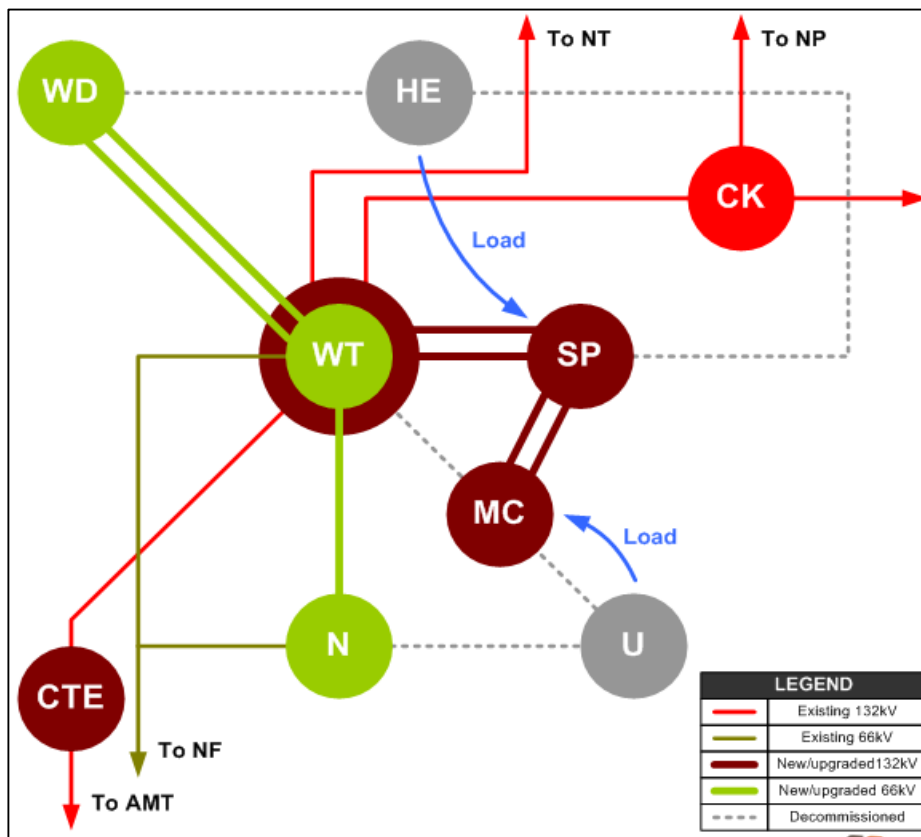
### Strategy 1



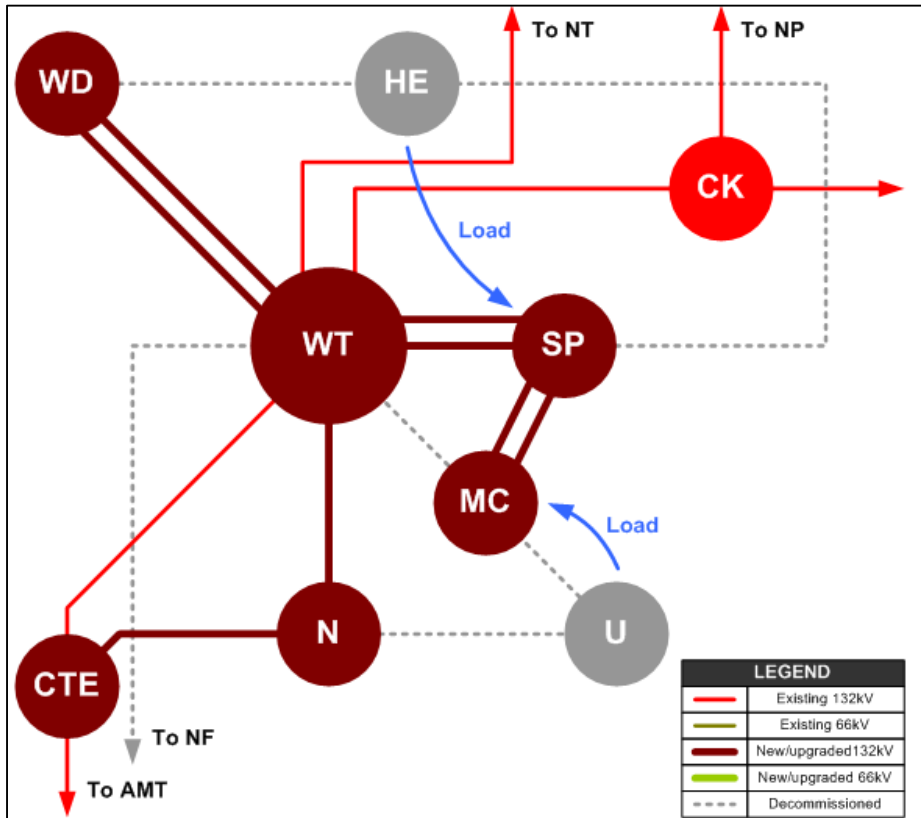
### Strategy 2



### Strategy 3



**Strategy 4**



**Non-Network Options Considered**

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- Demand Side Management (DSM):
  - The volume of DSM required to defer Shenton Park substation for one year in 2015 is 5350 kVA
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**Strategy 3** is recommended as it meets all the required technical performance standards whilst minimising the present value costs across the 25 year period.

NPC – Net Present Cost

### Recommendation - Strategy 3

- Based on the conclusion drawn from the analysis and Western Power obligations under the Electricity Networks Access Code 2004 for Major Augmentations it is recommended that the above investments be taken forward.
- The overhead line works includes the temporary stage involving the 132kV WT- NT line cut-in
- Total cost has been determined as part of the A1 estimate process using more refined figures than were available during the initial options analysis.
- It is recommended that the following investments be taken forward:
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  - Overhead line works associated with the 2 x 132kV WT-SPK line circuits
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### 3. QUESTION AND ANSWER SESSION

A question and answer session followed and is summarised below.

<b>Q</b>	Is this process essentially a self-governance system?
<b>A</b>	Yes, with safety and load growth key variables but still subject to independent assessment. We have to demonstrate that we have considered the network wide implications such as switch gear, buildings, cables, lines, gantries, etc. We are accountable to Economic Regulation Authority (ERA) to demonstrate value for money under considerable scrutiny.
<b>Q</b>	What are the associated costs?
<b>A</b>	More information is available in the Options Paper. Hard copies of the document are available here or can be downloaded from the ERA webpage.
<b>Q</b>	There is a dotted line in the diagram labelled as a de-commissioned line. Does this mean the lines will be removed?
<b>A</b>	Yes, however if a major load resulted again in the future we may reconstruct along these corridors in the future.
<b>Q</b>	Does Strategy 3 mean bigger power lines?
<b>A</b>	An existing 132kV line runs past Shenton Park at the moment. A localised tie in to the Shenton Park site would result but no new power line would be required from QEII to Shenton Park initially. Phase 2 will be to replace the two 66kV lines between the Shenton Park and Medical Centre Substation with 132kV lines in 2018. Detailed design, for these line works, has not been undertaken at this time. A detailed options analysis process will be completed prior to selecting a line route for these proposed 132kV lines.
<b>Q</b>	When will the line configuration be resolved?
<b>A</b>	It is a network wide consideration and will be done in the next six years. We will involve the community in the line route selection process in the future.
<b>Q</b>	Why can't we just double the voltage on the existing lines?
<b>A</b>	In some cases this is possible however, older lines may not meet current standards the Western Power must adhere to. Asset age becomes a key variable. The Options Paper provides the additional detail.
<b>Q</b>	When does the de-commissioning of the UWA site occur?
<b>A</b>	In the longer term and not identified in the slides as a result.
<b>Q</b>	What are the key benefits of the preferred strategy?

<b>A</b>	<p>The Options Paper provides a detailed description of the benefits of the preferred strategy (Strategy 3). A high level summary of the key benefits however are described below:</p> <ul style="list-style-type: none"> <li>• Lowest net present cost: Strategy 3 has the lowest net present cost of the 4 strategies considered.</li> <li>• Remaining transformer capacity: Strategy 3 will provide the second greatest remaining transformer capacity of 107 MVA in the year 2035. A network with greater spare capacity will be more flexible to accommodate unforeseen changes in load growth or large block load developments in the future, meaning further network upgrades can be deferred.</li> <li>• Decommissioned lines: Strategy 3 results in the decommissioning of the HE-WD, HE-SP, WT-MC, MC-U &amp; U-N lines by introducing 2 new lines between SP and MC, and upgrading existing line routes.</li> <li>• Losses: Strategy 3 provides the second lowest losses of the 4 strategies considered. Lowering losses will result in cost savings.</li> <li>• Substation sites: Strategy 3 results in the decommissioning of Herdsman Parade and University substations, providing visual benefits to those living nearby. The land at Herdsman Parade (which is owned by Western Power) could recover costs in the order of \$3.6M - \$5.2M through the remediation and subsequent sale of the site. A disadvantage is that there would be costs associated with the decommissioning of these sites (approx. \$1.2M &amp; \$1.5M for Herdsman Parade and University sites respectively).</li> </ul>
<b>Q</b>	Will the 66kV line from QEII to UWA drop to 11kV?
<b>A</b>	<p>The existing 66kV line will be removed and the distribution network used for supply purposes.</p> <p>Strategies 3 &amp; 4 of the proposed Western Terminal reinforcement involve the decommissioning of the existing University site and the Nedlands-University-Medical Centre 66 kV circuit. The University load will be transferred via the Distribution network (11 kV) to the new Medical Centre site. Therefore no additional transmission lines are required to accommodate the University load as part of this proposal. This is based on the current load forecasts over a 25 year period, however if there are any unforeseen block load developments or significant changes in load growth, these planning studies will need to be revised.</p>
<b>Q</b>	Are you aware of UWA tri-gen proposal?
<b>A</b>	Yes, with no impacts for this initiative.
<b>Q</b>	<p>Where will the 40 or so cars parked daily at the Autism Centre go when the land is used for the substation?</p> <p>We need a Western Power person on site to see what happens on a daily basis.</p>
<b>A</b>	<p>The bollards were removed to allow cars to park there without notification.</p> <p>The parking issue is a problem for everyone and access will be blocked to the site. Caroline will consider possible responses to this challenge.</p>
<b>Q</b>	Will there be a plan that shows the final concept?
<b>A</b>	Yes, the network configuration. Shenton Park substation plans are being finalised and will be presented at the fourth workshop.
<b>Q</b>	Where will Shenton Park workers park?
<b>A</b>	Confined to the new site with small crews on site for construction. There is no permanent presence on site.
<b>Q</b>	Have we considered expanding Western Terminal and moving Shenton Park to it?

<b>A</b>	<p>There is considerable infrastructure at Shenton Park and the 132kV line is in close proximity to this substation. The associated distribution network would have to be transferred to Western Terminal and we may not then be able to de-commission Herdsman substation.</p> <p>This is likely to result in more lines back to Shenton Park.</p> <p>A study was undertaken during the initial planning stages considering the use of Western Terminal and other sites as an alternative to developing Shenton Park.</p> <p>In order to utilise Western Terminal, possible remediation works was identified prior to construction due to it being a former landfill site. More vegetation clearing would also be required than with the existing Shenton Park site.</p> <p>Although there are fewer residential properties in the immediate vicinity, the development will have an impact on the equestrian centre. There is expected to result in major traffic disruption, spanning several months, during the distribution cabling phase of the project.</p> <p>In order to connect the existing distribution network to Western Terminal, 16 cable circuits would need to be installed. Additionally, Western Terminal would require a 132kV substation extension and necessary 132kV circuit works.</p> <p>Overall, the use of Western Terminal as an alternative site was estimated to cost around \$15M more than utilising the existing Shenton Park site.</p>
<b>Q</b>	<p>It may be worthwhile checking the lease arrangements for the panel beaters and other land uses within the nearby road/rail reserve. This may be a consideration as well and present some constraints or opportunities with between 50 to 80 cars parked in the area.</p>
<b>A</b>	<p>Caroline to seek resolution.</p>
<b>Q</b>	<p>What is the risk of the community being out of capacity as a result of the network as it currently exists?</p>
<b>A</b>	<p>This is a high risk with power outages likely to occur.</p>
<b>Q</b>	<p>Will these comments be considered as a submission?</p>
<b>A</b>	<p>Yes and will be posted on the Western Power website as such.</p>

#### 4. WORKSHOP SESSION

The workshop session provided an opportunity for participants to provide input to the various options. The following feedback was received:

- Office of Energy
  - There is good discussion and the responses are of interest to us and we are pleased to hear that the associated questions and answers will be posted on the website;
  - The line loss issue is very significant in a project of this type with major electrical losses to the atmosphere as heat potentially over an indefinite ongoing period if a sub-standard solution results;
  - There is also noise and other benefits associated with more efficient improved plant and equipment;
  - A summary of energy saved, greenhouse gasses saved and footprint reduction would be beneficial;
  - UWA and Shenton Park is already beyond capacity. What is the strategy for that? A strategy that addresses this is needed and we see this as a good solution. It would be good to have a better understanding of the vulnerability of the local community to power outage if transfer cannot be managed appropriately.
  - A summary of questions from the previous meetings would be beneficial and we will distribute both summaries to each group by email as soon as possible.



**ACTION: Caroline**

- Local community
  - The new Shenton Park link to QEII is of concern to the local community. It is difficult to make comment without relevant information with regard to line and tower locations.
  - Western Power will start working on the line configurations and route selection process with the aim of establishing a reference group to select assessment criteria and undertake options analysis.

**ACTION: Caroline**

- Lack of QEII planning has resulted in major traffic and other problems in the surrounding area. Consideration should be given to the associated parking, environmental, social or other impacts as a potentially huge administrative and management challenge to be addressed with City of Nedlands with associated traffic management in place for the associated works;
- A clear local Engagement Strategy is needed with Reference Group involvement to inform and involve the local community during the construction phase;
- Look for a solution that minimises net impacts for residents eg have we considered expanding Western Terminal and moving Shenton Park substation to it?;
- Seek opportunities for the Shenton Park substation site to go into the former Royal Perth Hospital Rehabilitation site.

**5. NEXT STEPS**

The next steps in the process include:

- Stakeholder feedback will be consolidated – mail, post, email, etc;
- Western Power will consider the comments and modify the strategies if and where appropriate;
- An ERA submission will be prepared subject to prior review by the Western Power Board;
- If supported it then goes to the ERA.

Linton thanked all participants for their positive involvement and the forum closed at 7:05pm.

# WESTERN POWER REGULATORY TEST - SHENTON PARK SUBSTATION UPGRADE

## PUBLIC FORUM

**Venue: Hollywood Bowling Club, 42 Smyth Road, Nedlands  
Tuesday 27 March 2012, 5.30-6.30pm**

### FORUM PURPOSE:

- To outline the proposed options for the Western Terminal Network and Shenton Park upgrade
- Discuss all options including alternative options
- Seek stakeholder views and comments on the proposed option
- Outline the future steps in the approvals process

### AGENDA

START AT	ITEM	BY
5.30pm	Refreshments, tea and coffee provided on arrival	
5:40	Welcome, purpose and process	Linton Pike
5:45	Project overview	Douglas Thomson
6:00	Questions and Answers	All
6:10	Workshop Session: Discussion of alternative options	All
6.20	Feedback	All
6.25	Next Steps	Douglas Thomson
6:30pm	Close	

## **Appendix C - EMF Readings**

## **Introduction**

During the consultation phase for the Shenton Park Regulatory Test, the question of “what are the current Electric and Magnetic Field (EMF) values along the existing lines” was asked. In response, Western Power measured the EMF values along the requested routes (Monash Avenue and Hampden Road).

## **Standards**

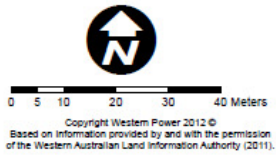
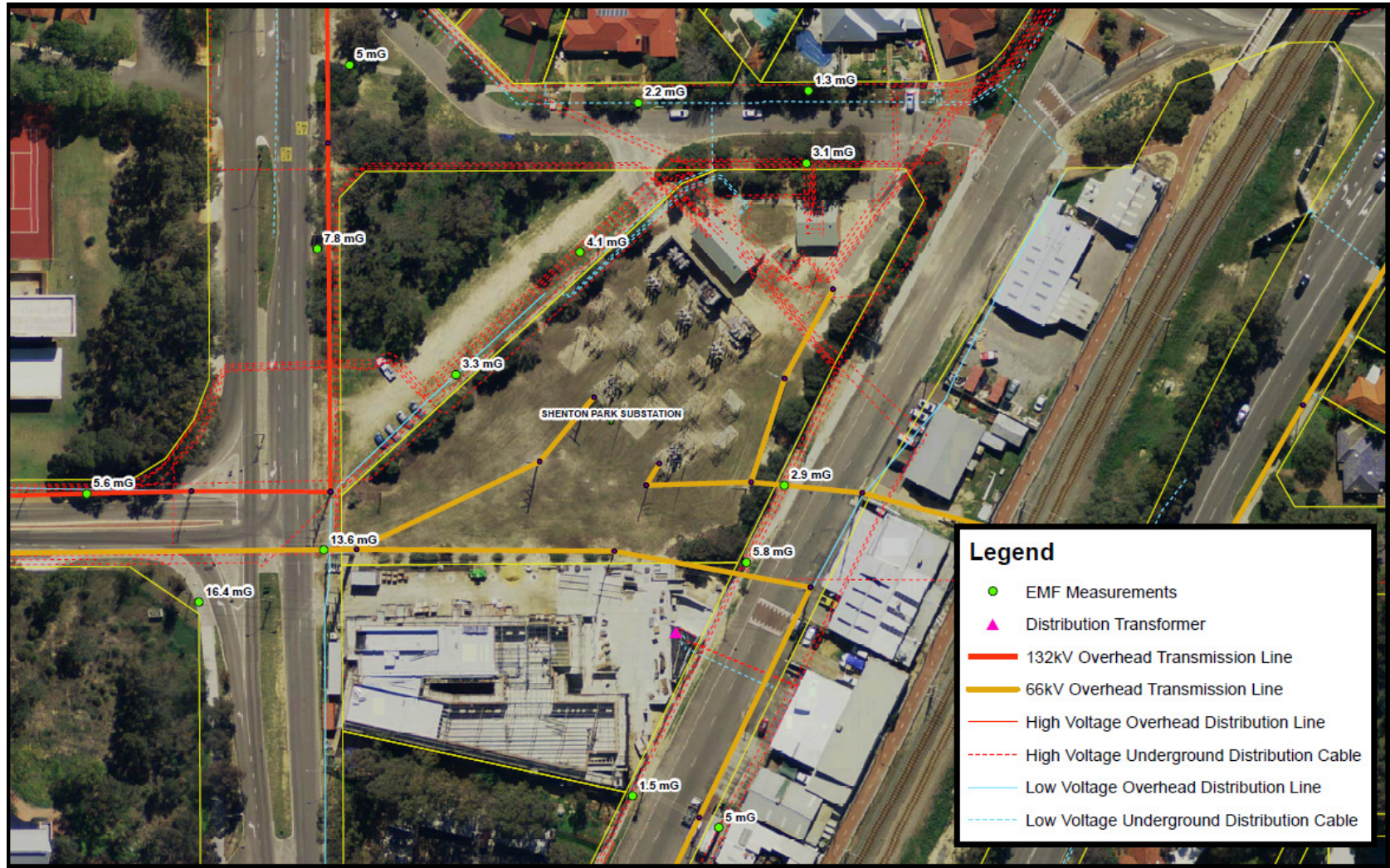
Western Power designs, constructs and operates our powerlines and facilities in compliance with the guidelines recommended by the World Health Organisation (WHO), National Health and Medical Research Council (NHMRC) and the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA).

Interim guidelines for human exposure to EMF by the public are 1,000 milliGauss (mG) for continuous 24 hours per day exposure. Generally EMF emission range from 2-20mG directly under a distribution line to 10-200mG directly beneath a transmission line.

The strength of EMF emissions rapidly decreases as we move away from the object emitting them.

## **Compliance**

Measurements for EMF were taken on the 19 April at 4pm (see figures below). All readings were significantly less than the guidelines indicated above. Western Power, therefore, do not anticipate any issues in relation to the existing lines and new works and we will continue to meet our obligations.



### Shenton Park EMF Measurements





0 20 40 80 120 160 Meters

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of the Western Australian Land Information Authority (2011).

### Hampden Road / Monash Avenue EMF Measurements

April 2012



